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Comprehensive search for topological materials using symmetry indicators

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Supplementary Information For “Comprehensive search for topological materials using symmetry indicators”

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I. EFFICIENT TOPOLOGICAL MATERIALS SCREENING

Our method of topological materials is based on the symmetry indicators [1], and it is highly efficient as we only need to calculate an expansion with respect to the atomic insulator basis (AIB). The 230 AIBs are explicitly shown for the 230 space groups ($\mathcal{SG}s$) in Sec. V of this supplementary material. As shown in Sec. V, each group owns a fixed number (d_{AI}) of AIB vectors (denoted as a_i) which are all integer-valued and may have a common factor (CF). We denote the CF of a_i by C_i . For the meaning of each row, ν is the total number of the bands and $n_{\mathbf{k},i}$ is the number of occurrences for the i th irreducible representation of the symmetry group of the high symmetry point \mathbf{k} . We arrange the AIB vectors, i.e., a_1, a_2, \dots in the order of ascending CFs. The last AIB vector with the largest CF is the so-called strong AIB vector. In *ab initio* calculations, we only need to use the eigen-states at all the high symmetry points, and obtain $n_{\mathbf{k},i}$ for the ν_e bands (ν_e is the total number of the valence electrons in the primitive unit cell). We thus obtain a vector $\mathbf{n} = (\nu_e, n_{\mathbf{k}_1,1}, n_{\mathbf{k}_1,2}, \dots, n_{\mathbf{k}_2,1}, \dots)^\top$ and then we only need to compute a collection of expansion coefficients q_i [2]:

$$\mathbf{n} = \sum_i q_i a_i \equiv Aq \Rightarrow q = A^{-1}\mathbf{n}, \quad (1)$$

where the i column of A is just a_i , and A^{-1} denotes the pseudo-inverse of A . The topological property of the material can be diagnosed simply by inspecting the coefficients q_i . There are three cases: (1) q_i are all integers, implying the material could be an atomic insulator; (2) some q_i are fractions while $q_i C_i$ are all integers, which implies all compatibility relations are satisfied and a continuous gap could be found at all high-symmetry points, lines, and planes; (3) Neither (1) nor (2) is true, which means there must be a band degeneracy at some high-symmetry points or lines.

Case (2) is the relevant case for the search of insulating topological materials. The possible sub-cases are:

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- (i) for centrosymmetric $\mathcal{SG}s$, let C_s be the largest CF and q_s be the expansion coefficient with respect to the corresponding AIB. Then if $q_s C_s \bmod C_s$ is an odd number, we obtain a (strong) topological insulator (TI). Otherwise, we obtain a topological crystalline insulator (TCI);
- (ii) for S_4 symmetric noncentrosymmetric $\mathcal{SG}s$ one finds $C_s = 2$. For case 2, $q_s C_s \bmod 2$ must be 1, which corresponds to a strong TI if it is not a Weyl semimetal (WSM);
- (iii) for C_3 and mirror symmetric noncentrosymmetric $\mathcal{SG}s$ with $C_s = 3$, $q_s C_s \bmod 3 = 1$ or 2 corresponds to a mirror Chern, strong and/ or a weak topological insulator if it is not a WSM.

Thus, from the CFs, we can assign an Abelian group $X_{BS} = \mathbb{Z}_j \times \mathbb{Z}_{j+1} \times \dots \times \mathbb{Z}_{d_{AI}}$ where j denotes the first AIB vector whose CF is larger than 1. We use the results of $r_m = q_m C_m \bmod C_m$ as the value in the factor group \mathbb{Z}_m where $m = j, j+1, \dots, d_{AI}$. They are written in the form of $(r_j, r_{j+1}, \dots, r_{d_{AI}})$ which is called SI and can be used as a fast diagnosis of topological materials.

Note that, while a nonzero SI guarantees the existence of nontrivial band topology, generally it does not uniquely determine the precise topological phase of the system [1, 3]. Nonetheless, for almost all cases one can distinguish between a strong TI and a TCI using only the SI. The only exception to this concerns noncentrosymmetric $\mathcal{SG}s$ with both a mirror together with a C_3 rotation about the axis normal to the mirror plane (i.e., the \mathcal{SG} contains $\bar{6}$ rotoinversion, but not C_6 rotation), as we discussed above in the sub-case (iii) of case (2). Here is a complete list of such $\mathcal{SG}s$: **174**, **187**, **188**, **189**, and **190**. For these $\mathcal{SG}s$, materials listed in the table of TCIs might in fact be a strong TI. As an example, the strong TI AgAsCa [4] in \mathcal{SG} **189** has SI $(1, 1) \in \mathbb{Z}_3 \times \mathbb{Z}_3$, and is listed under Table II for TCIs.

II. TOWARDS IDEAL TOPOLOGICAL INSULATORS AND TOPOLOGICAL CRYSTALLINE INSULATORS

We list all the relatively good topological insulators found in our search by GGA calculations in the following table. The structure references are provided after the names of these materials. Through a further checking by the MBJ calculations, if the GGA calculations predicted band topology is maintained, we print the material name in blue. While in some cases, the MBJ calculations, however, predict a TCI phase, we print the name in red. For the materials whose names are in black, the MBJ calculations mostly predict a trivial insulator though they are predicted as TIs by GGA calculations. In very few cases, the MBJ calculations predict a (semi-)metal phase.

Part 1 of Table I:

TABLE I. The list of 241 TIs with relatively clean Fermi surfaces discovered by GGA calculations: when the MBJ calculation doesn't change the band topology predicted by GGA calculations, we print the material in blue, while the red color means that the MBJ calculation results in a topological crystalline phase. Note that the elements in a compound are arranged in the alphabetical order, e.g., CaAs₃ is listed as As₃Ca.

SG	X_{BS}	Topological insulators
2	$\mathbb{Z}_2^2 \times \mathbb{Z}_4$	Ag₂F₅ [5],As ₃ Ca[6, 7],As ₃ Sr[8, 9],AgO ₄ S[10],Br ₅ W[11],CaMo ₆ S ₈ [12],CaP ₃ [9, 13]
11	$\mathbb{Z}_2^2 \times \mathbb{Z}_4$	BBeLi [14], CaSb₂ [15], GeHfPd [16], HfS₃ [17], Mo₂S₃ [18], Nb₂Se₃ [19], Se₃Ta₂ [19, 20]
12	$\mathbb{Z}_2^2 \times \mathbb{Z}_4$	Ag ₄ K ₂ Se ₃ [21],Al ₂ Ge ₄ Sr ₃ [22],Al ₈ Mo ₃ [23],As ₃ Ba[9, 24], As₃Sr [9, 25],Au ₂ P ₃ [26],BaSb ₃ [27] Ba ₂ Cd ₂ Sb ₃ [28], Ba₂Hg₃O₁₄Pd₇ [29], Ba₃Li₄Sn₈ [30], BaTi₄ [31], Ba₁₁Bi₁₄Cd₈ [32],Bi ₂ Pb ₃ S ₆ [33] Bi ₄ Pb ₇ Se ₁₃ [34],Br ₄ Cs ₂ I ₂ Pd[35], Nb₂PdS₅ [36],Nb ₂ PdS ₆ [37], Nb₂PdSe₆ [37],P ₃ Sr[38] ,PdSe ₆ Ta ₂ [37],PtSe ₇ Ta ₂ [39]
14	$\mathbb{Z}_2 \times \mathbb{Z}_4$	Ag₂Te [40, 41], Au₄Li [42], B₂S₃ [43],BaNb ₂ O ₆ [44]
15	$\mathbb{Z}_2 \times \mathbb{Z}_4$	MoP ₄ [45],O ₅ Ti ₃ [46]
51	$\mathbb{Z}_2^2 \times \mathbb{Z}_4$	AlPt₂ [47], AuTe₂ [48], Au₃Rb₂Tl [49]
55	$\mathbb{Z}_2 \times \mathbb{Z}_4$	Bi₆In₂Sr₅ [50]
58	\mathbb{Z}_4	Bi₂Hf [51], S₂Ti [52]
59	$\mathbb{Z}_2 \times \mathbb{Z}_4$	Ag₃Sb [53], AuCs ₃ Pb ₄ [54], AuPb₄Rb₃ [54], AuRb ₃ Sn ₄ [54]
60	\mathbb{Z}_4	Au₂Pb [55], O ₂ Pb[56]
62	\mathbb{Z}_4	AsCdNa[57], As₂Hf [58], As₂Zr [59, 60],Ba ₂ Pb[61],Ba ₂ Si[62, 63],Ca ₃ GeO[64],CdGeSr[65],CdNaSb[66, 67],FSeY[68] GeHfPt[69, 70],GeMoZr[71],GePdZr[72, 73],GePtZr[73, 74],GeZr[75],Ge ₂ InLiSr ₂ [76], Ge₂Mo [77] Ge ₂ W[78], HfNbP[79],HfP ₂ [80],HfSi[81],NNa ₃ [82],N ₅ Ta ₃ [83],PPtSc[73, 84] P ₂ Zr[85],P ₂ Ti[86],PbSr ₂ [87, 88],PdSiTi[73, 89],PdSiZr[75],PtSiTi[73, 74],PtSiZr[73, 90],Sb ₂ SrZn[91, 92],SiSr[93],SiTi[94],SiZr[94] AlLaPt[95],AuLa[95],GaLaPd[96],GaLaPt[96],GaLuPd[96],LaPPt[97]
63	$\mathbb{Z}_2 \times \mathbb{Z}_4$	AgS ₃ Ta[98],AlBMo[99],AlBW[99], Al ₂ BaSi ₂ [100], AuClTe ₂ [101], B ₇ WY ₃ [102],CaSi [103] Ga[104],GeNa ₂ Zn[105], HfPd[106],HfTe ₅ [107, 108],Te ₅ Zr[107, 108] AlLa[109],GaLa[110],GaLu[111],LiLuSn ₂ [112]
64	$\mathbb{Z}_2 \times \mathbb{Z}_4$	As [113], C ₂ B ₂ Mg[114]
65	$\mathbb{Z}_2^2 \times \mathbb{Z}_4$	Ag₃Te₂Tl [115],Ba ₃ Ge ₄ [116],AlB ₄ Lu[117],LaSn ₂ [118]
69	$\mathbb{Z}_2^2 \times \mathbb{Z}_4$	Be₂Zn [119]
71	$\mathbb{Z}_2 \times \mathbb{Z}_4$	AsTeTi [120],Br ₂ Ca ₃ Si[121]
72	$\mathbb{Z}_2 \times \mathbb{Z}_4$	Br ₂ Hg ₅ O ₄ [122]
87	$\mathbb{Z}_2 \times \mathbb{Z}_8$	Hf₅Te₄ [123], Se₄Ti₅ [124], Te₄Zr₅ [125]
121	\mathbb{Z}_2	Ag ₂ S ₄ SnZn[126]
122	\mathbb{Z}_2	As ₂ CdGe[127],As ₂ CdSn[128],As ₂ SnZn[129],CdSb ₂ Sn[130]
123	$\mathbb{Z}_2 \times \mathbb{Z}_4 \times \mathbb{Z}_8$	BaGe ₃ Mg ₄ [131],ClNa ₂ [132],ClNa ₃ [132]
127	$\mathbb{Z}_4 \times \mathbb{Z}_8$	B₄Y [133],CsI ₃ Sn[134, 135], Pt₃Si [136], B₄La [137], B₄Lu [138]
129	$\mathbb{Z}_2 \times \mathbb{Z}_4$	HfSb₂ [139]
136	\mathbb{Z}_4	Ag ₅ CsSe ₃ [140],Ag ₅ CsTe ₃ [141]
139	$\mathbb{Z}_2 \times \mathbb{Z}_8$	Ag₂Zr [142], BaCd₂Ge₂ [143], BaGe₂Mg₂ [144] CaGe₂Zn₂ [144], Cd₂Ge₂Sr [145], Ge₂SrZn₂ [146], InPd₃ [147], Pd₂Ti [148]

Part 2 of Table I:

140	$\mathbb{Z}_2 \times \mathbb{Z}_8$	Hf ₂ Si[149],SiZr ₂ [150],Sb ₂ Ti[151],Si ₃ Sr ₅ [152],Sn ₃ Sr ₅ [153]
164	$\mathbb{Z}_2 \times \mathbb{Z}_4$	Ag ₂ O[154],As ₂ Ge ₅ Te ₈ [155],As ₄ GeTe ₇ [156],BaSn ₂ [157, 158],Be[159],Bi ₂ Li ₃ Y[160],Bi ₂ Mg ₃ [161, 162] Bi ₂ Pb ₂ Se ₅ [163, 164],Bi ₄ SnTe ₇ [165],CNb ₂ [166],CTa ₂ [167],C ₆ K ₂ N ₆ PtS ₆ [168],C ₆ N ₆ PtRb ₂ S ₆ [168] CaGe ₂ [169, 170],CaSi ₂ [170, 171],GeSb ₄ Te ₇ [172],Ge ₂ Sr[170, 173],PdTe ₂ [174, 175],PtTe ₂ [176, 177],Sb ₂ Te ₂ [178],SiTe ₂ [179]
166	$\mathbb{Z}_2 \times \mathbb{Z}_4$	Cl ₈ Na ₂ Ti ₃ [180],Al ₁₀ Ba ₇ [181],As[182],As ₂ CaGa ₂ [183] As ₂ Ge ₄ Te ₇ [184],As ₂ Sn ₂ Sr[185, 186],Bi ₂ GeTe ₄ [187, 188], Bi ₂ PbTe ₄ [189],Bi ₂ SeTe ₂ [190, 191],Bi ₂ Se ₃ [192, 193],Bi ₂ Te ₃ [193, 194] Bi ₆ PbTe ₁₀ [194],CS ₂ Ta ₂ [195],CY ₂ [196],C ₅ Ti ₈ [197] CaGe ₂ [198],CaSi ₂ [199, 200],GaGeTe[201] GaP[202],In ₂ Te ₃ [203] N ₂ W[204],Sb[205],SbTe ₂ Tl[206, 207],Sb ₂ SeTe ₂ [208, 209] Sb ₂ SnTe ₄ [210, 211],Sb ₂ Te ₃ [193, 212],Sb ₈ Te ₃ [213],Sb ₄₈ Te ₉ [213] ClLa[214]
191	$\mathbb{Z}_6 \times \mathbb{Z}_{12}$	B ₂ Sr[215],BaSi ₂ [216],CaSi ₂ [217],Ti[218]
193	\mathbb{Z}_{12}	Pb ₃ TeZr ₅ [219]
194	\mathbb{Z}_{12}	AlN ₃ Ti ₄ [220],Al ₂ Hf[221],C ₂ AlTa ₃ [222],Ca ₂ IN[223] MgPo[224],SiSr ₂ [225]
216	\mathbb{Z}_2	AgKO[226],AgNaO[226],AgORb[226],HgS[227],InN[228],NTI [229]
221	$\mathbb{Z}_4 \times \mathbb{Z}_8$	AlSc[230],AlY[231],B ₆ Ca[232],B ₆ Sr[232],BeTi[233] Br ₃ CsGe[234],Br ₃ CsPb[235],CsI ₃ Sn[236] PbSe[237]
223	\mathbb{Z}_4	BiNb ₃ [238],Nb ₃ Sb[239],SbTa ₃ [240, 241]
225	\mathbb{Z}_8	BiY[242],CZr[243],Li ₂ MgSi[244],N ₂ Pd[245],AsLa[246, 247],BiLa[246, 247],BiLu[248] LaP[247, 249],LaSb[247, 250]
227	\mathbb{Z}_4	CTi ₂ [251],Se[252]

We list all the relatively good topological crystalline insulators found in our database topological materials searches by GGA calculations in the following table. We give all the structure references behind the names of these materials. Through a further checking by the MBJ calculations, if the GGA calculations predicted band topology is maintained, we print the material name in blue. While in some cases, the MBJ calculations, however, predict a TI phase, we print the name in red. For the materials whose names are in black, the MBJ calculations mostly predict a trivial insulator though they are predicted as TCIs by GGA calculations. In very few cases, the MBJ calculations predict a (semi-)metal phase.

SG	X_{BS}	Topological crystalline insulators
2	$\mathbb{Z}_2^3 \times \mathbb{Z}_4$	CsHg[253]
11	$\mathbb{Z}_2^2 \times \mathbb{Z}_4$	BaSb ₂ [254],MoTe ₂ [255],Sb ₂ Sr[256],Se ₃ Ta[257, 258]
12	$\mathbb{Z}_2^2 \times \mathbb{Z}_4$	Al ₄ Cl ₅ Zr ₁₂ [259],Al ₄ Na ₄ P ₁₂ Sr ₈ [260],As ₂ Nb[261, 262],As ₂ Ta[262, 263],As ₃ Mo ₂ [264],As ₃ W ₂ [265] As ₄ Ba ₃ Zn ₂ [266],Ba ₃ Cd ₂ Sb ₄ [267],BiBr[268],BiHf ₂ [269],Bi ₂ ITe[270, 271],CdK ₆ Pb ₈ [272],ClZr [273] Cl ₈ NSc ₅ [274],NbP ₂ [275],NbSb ₂ [276],Sb ₂ Ta[277, 278],Se ₄ Ti ₃ [279],Ta ₂ Te ₃ [280],Ge ₂ Re[281]
14	$\mathbb{Z}_2 \times \mathbb{Z}_4$	LaSbSe[282],AsSY[283],LaSbSe[282]
51	$\mathbb{Z}_2^2 \times \mathbb{Z}_4$	GaPt ₂ [284]
55	$\mathbb{Z}_2 \times \mathbb{Z}_4$	Ca ₅ Ga ₂ Sb ₆ [285]
58	\mathbb{Z}_4	Bi ₃ RbS ₅ [286]
59	$\mathbb{Z}_2 \times \mathbb{Z}_4$	BrNTi[287]
62	\mathbb{Z}_4	HgSr ₃ [288],LaSbTe[289]
63	$\mathbb{Z}_2 \times \mathbb{Z}_4$	BaGe[290],BaSi[291], BaSn[292],BaPb[293],Ba ₃ Pb ₅ [294],Ca ₂ InN[295],Ba ₅ Cd ₂ FSb ₅ [296], CaGe[297],CaSn [298] Cd ₂ FSb ₅ Sr ₅ [299],PbSr[300],SnSr[301],AlGeLu[302],La ₂ Li ₂ Si ₃ [303],Ge ₃ La ₂ Li ₂ [304]
64	$\mathbb{Z}_2 \times \mathbb{Z}_4$	Ca ₅ Ga ₂ N ₄ [305],Li[306]
69	$\mathbb{Z}_2^2 \times \mathbb{Z}_4$	Ge ₆ Li ₂ Sr ₄ [307]
71	$\mathbb{Z}_2 \times \mathbb{Z}_4$	Ba ₃ Bi ₄ Li ₄ [308],Ba ₃ Li ₄ Sb ₄ [308]
87	$\mathbb{Z}_2 \times \mathbb{Z}_8$	Au ₄ Ti[309]
88	\mathbb{Z}_4	O ₄ PbPd ₂ [310]
123	$\mathbb{Z}_2 \times \mathbb{Z}_4 \times \mathbb{Z}_8$	As ₃ CsZn ₄ [311],As ₃ RbZn ₄ [311],Pd ₃ Sn[312]
129	$\mathbb{Z}_2 \times \mathbb{Z}_4$	AsGeNb[313],GeHfS[314, 315],GeHfSe[314, 315],GeHfTe[314, 315],GeNbSb[316],GeSZr [317] GeSeZr[314],HfSSi[314, 315],HfSeSi[314, 315],OSiZr[314],SSiZr[318],SeSiZr[318],SiTeZr[318],SnTeZr[318]
137	\mathbb{Z}_4	Ba ₂ LiN[319]
139	$\mathbb{Z}_2 \times \mathbb{Z}_8$	AsBa ₂ [320],AsCa ₂ [321] Ba ₂ Bi[322],Ba ₂ Sb[323],BiSr ₂ [323],Bi ₂ F ₂ OSr ₂ Ti ₂ [324],Br ₂ Ca ₃ Si [325],SbSr ₂ [326]
140	$\mathbb{Z}_2 \times \mathbb{Z}_8$	Bi[327],GePt ₃ [328]
148	$\mathbb{Z}_2 \times \mathbb{Z}_4$	Mo ₃ S ₄ [329]
164	$\mathbb{Z}_2 \times \mathbb{Z}_4$	BaSi ₂ [330],BiTe[331],Bi ₂ Pb ₂ Te ₅ [332, 333], Bi ₂ Se ₂ [334],Bi ₃ STe ₂ [335],Te ₂ Zr[336]
166	$\mathbb{Z}_2 \times \mathbb{Z}_4$	AsNaTe ₂ Zr ₂ [337],As ₃ Cd ₄ K[338] As ₃ Cd ₄ Na[338],As ₃ Cd ₄ Rb[338],Bi[339],Bi ₄ Se ₃ [340, 341],Bi ₈ Se ₉ [342],BrZr[343],CNb ₂ S ₂ [344] ClZr[273],Hg[345],P[346] BrLa[347]
187	$\mathbb{Z}_3 \times \mathbb{Z}_3$	CHf[348],InNbSe ₂ [349, 350],NY[351]
189	$\mathbb{Z}_3 \times \mathbb{Z}_3$	AgAsCa[4, 352],AgCaP[4, 353] GeLiY[354],AsLuPd[355]
191	$\mathbb{Z}_6 \times \mathbb{Z}_{12}$	B ₂ Zr[356]
193	\mathbb{Z}_{12}	Pb ₃ SZr ₅ [357]
194	\mathbb{Z}_{12}	AsHgK[358, 359],C[360],CdNa ₂ Sn[361], HgKSb[359, 362],SnTi ₂ [363]
221	$\mathbb{Z}_4 \times \mathbb{Z}_8$	Ba ₃ OPb[364, 365],CaPd[366],Ca ₃ GeO[364, 365],Ca ₃ OPb[365, 367],Ca ₃ OSn[364],NTi ₃ Tl[368] NY[369],OPbSr ₃ [364, 365],PbPt ₃ [370],Pt ₃ Sn[371]
225	\mathbb{Z}_8	AsSc[372],Au ₂ InSc[373],Au ₂ InY[374],Ba[375],BiI ₃ [376],BiSc[377] CPt[378],Ca[205],SSn[379],SbSc[380],SeSn[381], SnTe[382, 383],LuSb[384]
227	\mathbb{Z}_4	S ₂ Ti[385]

TABLE II. The list of 142 TCIs with clean Fermi surfaces discovered by GGA calculations where the color blue denotes that the MBJ calculation doesn't change the band topology while the red color means that the MBJ calculation results in a strong insulator. Note that the elements in a compound are arranged in the alphabetical order, e.g., TiS₂ is listed as S₂Ti.

We further highlight a few exceptionally promising candidates which have a full band gap larger than or equal to room temperature, i.e., ≥ 25 meV. They are listed in Table III. Importantly, this list of materials demonstrates a large chemical and structural diversity, which will hopefully provide new topological materials classes that do not suffer from the practical limitations of growing high-quality, insulating samples of the famous Bi_2Se_3 family for strong TI materials [386–388] and the SnTe family for TCIs [389, 390].

In addition to the TIs and TCIs highlighted in Table III, there are also many TIs/TCIs with sizable direct band gap and small Fermi pockets in Tables I and II. Despite lacking full band gaps, they nonetheless have relatively large direct continuous gaps throughout the Brillouin zone (BZ). Therefore, these TIs/TCIs might also display robust topological features, and depending on the elements involved they could be favorable for certain specific applications. We believe these compounds also deserve future research attention.

Material name (space group)	Prediction (Method)	Full band gap
Sb_2Sr ($\mathcal{SG}11$)	TI (MBJ)	120 meV
$\text{Al}_2\text{Ge}_4\text{Sr}_3$ ($\mathcal{SG}12$)	TI (MBJ)	26 meV
$\text{Ba}_{11}\text{Bi}_{14}\text{Cd}_8$ ($\mathcal{SG}12$)	TI (MBJ)	34 meV
O_2Pb ($\mathcal{SG}60$)	TI (GGA)	40 meV
AsCdNa ($\mathcal{SG}62$)	TI (GGA)	87 meV
$\text{Br}_2\text{Ca}_3\text{Si}$ ($\mathcal{SG}71$)	TI (GGA)	50 meV
Ag_5CsSe_3 ($\mathcal{SG}136$)	TI (GGA)	40 meV
Ag_5CsTe_3 ($\mathcal{SG}136$)	TI (GGA)	46 meV
$\text{C}_6\text{K}_2\text{N}_6\text{PtS}_6$ ($\mathcal{SG}164$)	TI (GGA)	50 meV
$\text{C}_6\text{N}_6\text{Rb}_2\text{PtS}_6$ ($\mathcal{SG}164$)	TI (GGA)	55 meV
$\text{As}_2\text{Sn}_2\text{Sr}$ ($\mathcal{SG}166$)	TI (GGA)	30 meV
GaGeTe ($\mathcal{SG}166$)	TI (GGA)	25 meV
HgS ($\mathcal{SG}216$)	TI (GGA)	150 meV
$\text{Bi}_2\text{Pb}_2\text{Te}_5$ ($\mathcal{SG}164$)	TCI (MBJ)	40 meV
Bi_2Se_2 ($\mathcal{SG}164$)	TCI (MBJ)	25 meV

TABLE III. Good TI or TCI candidates with band gap larger than or equal to 25 meV. We give both the topological predictions together with the method used (GGA or MBJ) and the corresponding full band gaps. For comparison, the band gap for the strong TI Bi_2Se_3 is 258 meV (GGA) and that for the TCI SnTe is 234 meV (GGA). Note that the elements in a compound are arranged in the alphabetical order, e.g., $\text{Sr}_3(\text{AlGe}_2)_2$ is listed as $\text{Al}_2\text{Ge}_4\text{Sr}_3$.

III. TOPOLOGICAL (SEMI-)METALS

We list all the relatively good topological (semi-)metals found in our database topological materials search by GGA calculations in the following table. Each material belongs to a specialized \mathcal{SG} , and we give all the structure references behind each the name.

Part 1 of Table IV:

TABLE IV. The list of 692 topological (semi-)metals with relatively clean Fermi surfaces discovered based on the GGA calculations: Note that the elements in a compound are arranged in the alphabetical order, e.g., Cd₃As₂ is listed as As₂Cd₃.

SG	Topological (semi-)metals
11	Br ₉ TeW[391], CBrHgNS[392], Li ₇ Sn ₃ [393], Mo ₂ S ₂ Sb[394]
15	BaLa ₄ [395]
51	AuCd[396], AuTi[397]
52	Ag ₂ BiO ₃ [398], Bi ₃ Sr ₂ [399]
55	Al ₃ Pd ₅ [400], Al ₃ Pt ₅ [401], BCl ₆ Sc ₄ [402], Bi ₉ Ca ₉ Cd ₄ [403], Bi ₉ Ca ₉ Zn ₄ [404], Bi ₉ Cd ₄ Sr ₉ [403], In ₅ S ₁₃ Y ₄ [405]
57	AlCaPd[406], BiK ₂ Sn[407]
58	C ₆₀ K[408]
59	Ag ₃ Sn[409]
60	F ₄ NaTi[410], O ₂ Re[411]
61	AgF ₂ [412]
62	AgAuF ₇ [413], AgF ₃ K[414], AlPt ₂ [415] Bi ₃ Ca ₅ [416], Bi ₃ Sr ₅ [417], Ca ₅ Sb ₃ [418] GeNb ₃ Te ₆ [419], GePd ₂ Y[420], N ₃ Nb ₂ [421], Nb ₃ Si[422] PdSbZr[423], SiTa ₃ Te ₆ [423], AuLu ₂ [424], GeLa[425], GeLaPd ₂ [425], GeLuPd ₂ [426], LuPd ₂ Si[427], LuPt[428], LuPt ₂ Si[429]
63	AgCa[430], AuCa[431], BiZr[432], Ga ₃ PdSr[433], Ga ₅ Zr ₃ [434], GeSc[435], GeY[436], HfSb[437], K ₃ O ₄ Pd ₂ [438], K ₃ O ₄ Pt ₂ [439], K ₄ P ₃ [440, 441], N ₅ NaTa ₃ [442], PdY[443], SiY[444], Sr ₃ Tl ₅ [445], LuSi[446], Al ₆ Re[447]
64	AgCs ₂ F ₄ [448], Au ₁₀ Ca ₄ In ₃ [449], Bi[450, 451], LaSb ₂ [452]
65	C ₇ Re ₂ Sc ₅ [453], Ge ₁₀ La ₇ Li ₈ [454]
71	ReSi ₂ [455]
74	Ag ₂ La[456], Au ₂ La[456], In ₂ La[457]
87	Ba ₉ In ₄ [458], In ₄ Pd ₁₇ Se ₄ [459], Pt ₁₁ Zr ₉ [460], Pt ₁₂ Si ₅ [461]
88	Al ₂₁ Pt ₈ [462], CsFO ₃ S[463], Ge ₈ Pd ₂₁ [464], LaO ₄ Pd ₂ [465]
123	AgPPt ₅ [466], AlPPt ₅ [466], AsInPd ₅ [467], AsPd ₅ Tl[468] AsPt ₅ Tl[468], As ₂ BaPd ₂ [469], BaP ₂ Pd ₂ [470], CaPb[471] CdPd[472], CdPd ₅ Se[473], CdPt[474], Cd ₃ Zr[475] FKNb ₄ O ₅ [476], HgPd[477], HgPd ₅ Se[478], HgPt[479], Hg ₂ Pt[479] InPPd ₅ [480], InPPt ₅ [480], PPd ₅ Tl[480], PPt ₅ Tl[480] PdTi[481], Pd ₅ SeZn[482], SiSr[483], Sr[484], C ₂ Re[485], AsLa[486], LaSb[487]
127	AlSc ₂ Si ₂ [488], Au ₂ Ca ₂ Pb[489], Au ₂ InY ₂ [490], B ₂ Ta ₃ [491] B ₄ W[492], C ₂ B ₂ Y[493], Ga ₂ MgSc ₂ [494], Ca ₃ Hg ₂ [495] Ga ₂ Nb ₃ [496], Ga ₂ Ta ₃ [497], Ge ₂ Hf ₃ [498], Hg ₂ Sr ₃ [499, 500] InPd ₂ Y ₂ [501], In ₅ Ti ₂ [502], LiSi ₂ Y ₂ [503], PbPd ₂ Y ₂ [504], N ₂ Re[505]
129	AgMgSb[506], AsNbSi[507], AsSiTa[508], BaMgSi[509], BiKMg[510], GeTeZr[511], MoNTa[512]
130	AlMg ₄ Si ₃ [513], Se ₃ Tl ₅ [514]
131	OPd[515]
136	AlNb ₂ [516], AlTa ₂ [517], Bi ₂ MgO ₆ [518], O ₂ Pb[519, 520], O ₂ Pd[521], O ₂ Pt[522], O ₂ Re[523]
137	As ₂ Cd ₃ [524, 525], Bi ₂ Se ₃ [526]
139	Ag ₂ CaGe ₂ [527], Ag ₂ Ge ₂ Sr[527], Ag ₂ Si ₂ Sr[528], Ag ₂ Sn ₂ Sr[529], Al ₂ BaSi ₂ [530], Al ₂ Pb ₂ Sr[531], Al ₃ Nb[532] Al ₃ Ta[533], Al ₃ Zr[534], Al ₄ Ba[535], Au ₄ CaCd ₂ [536], BaBi ₄ Cl ₂ O ₆ [537], BaIn ₄ [538], Be ₁₂ Pd[539], Be ₁₂ Pt[539] CaGa ₄ [540], Ca ₁₁ Sb ₁₀ [541], Ga ₃ Nb[542, 543], Ga ₃ Ta[544], In ₄ Sr[545], Pt ₃ Sb[546], S ₂ Ti[547], Sb ₁₀ Sr ₁₁ [548] Si ₂ W[549], ZnZr ₂ [550], Ag ₂ Lu[551], Au ₂ Lu[552]
140	AgCsF ₃ [553], AgF ₃ Rb[553], AgIn ₂ [554], AlZr ₂ [555], AuSe ₃ Tl ₄ [556], AuTl ₂ [557], Au ₃ Cd ₅ [558] Au ₄ In ₂ K[559], Au ₄ In ₂ Rb[559] BGe ₂ Nb ₅ [560], BMo ₂ [561], BTa ₂ [562], BTi ₂ [563], BW ₂ [564], Ba[565], BeTa ₂ [566], Bi ₃ In ₄ Pb[567] Ca ₅ Pt ₃ [568], Ca ₅ Si ₃ [569] Cs ₉ InO ₄ [570], GaHf ₂ [571], GaPt ₃ [572], GaZr ₂ [573], Ga ₅ Pd[574], GeHf ₂ [575], Ge ₃ Mo ₅ [576] Ge ₃ Nb ₅ [577], Ge ₃ W ₅ [578], Nb ₅ SiSn ₂ [579] Nb ₅ Si ₃ [580], Pb ₃ Sr ₅ [581], PdTl ₂ [582], SZr ₂ [583] Si ₃ W ₅ [584], Sr[585], Te ₃ Tl ₅ [586]
163	AlF ₆ LiPd[587], F ₆ GaLiPd[588], In ₂ Pt ₃ [589]
164	AlCl ₃ [590], CS ₂ [591], CaHg ₂ [592], CaSb ₂ Zn ₂ [593], Cl ₂ Ti[594], HfTe ₂ [595, 596], Hg ₇ K ₂ [597] Hg ₇ Rb ₂ [597], OTi ₂ [598], Sb ₂ SrZn ₂ [599], Se ₂ Ti[600]
166	BaPb ₃ [601], Be ₁₇ Hf ₂ [602], Be ₁₇ Nb ₂ [603], Be ₁₇ Ta ₂ [602], GeTe[604, 605], Pb ₂ Pd ₃ S ₂ [606] Pb ₂ Pd ₃ Se ₂ [607], Po[608], SbSn[609] AgInSe ₂ [610], As ₃ NaZn ₄ [611], Bi ₄ Te ₃ [612], C ₃ Al ₈ N ₄ [613], Cd ₄ KP ₃ [614], GeP ₃ [615], In ₂ Se ₃ [616], Pd ₃ Se ₂ Tl ₂ [617], Ag ₄ Sb ₂ Sr[618]
167	Al ₅ Mo[619], Cs ₈ Ga ₁₁ [620], F ₃ Mo[621], F ₃ Pd[622], F ₃ Ti[623], In ₁₁ K ₈ [624] K ₈ Tl ₁₁ [625], Mo ₉ S ₁₁ Tl ₂ [626], NPd ₃ [627]

Part 2 of Table IV:

176	AgCd ₃ F ₂₀ Hf ₃ [628], AgCd ₃ F ₂₀ Zr ₃ [628], AgMo ₃ Se ₃ [629], AsNb ₃ Te ₃ [630] CsMo ₃ S ₃ [631], CsMo ₃ Se ₃ [632], CsMo ₃ Te ₃ [633], InMo ₃ Se ₃ [186, 634] InMo ₃ Te ₃ [186, 634], KMo ₃ S ₃ [634], KMo ₃ Se ₃ [186, 634], KMo ₃ Te ₃ [186, 635], LiMo ₃ Se ₃ [634] Mo ₃ NaSe ₃ [186, 634], Mo ₃ NaTe ₃ [186, 634], Mo ₃ RbS ₃ [634], Mo ₃ RbSe ₃ [634, 636] Mo ₃ RbTe ₃ [637], Mo ₃ Se ₃ Tl [186, 634], Mo ₆ Se ₆ Tl ₂ [638], NbSe ₂ [639]
186	HgPbSr [640], HgSnSr [640], CaHgSn [640], CaHgSn [640]
187	AgN [641], CLiNaO ₃ [642], CMo [643], CPt [644], CTa [644], CW [645] InS ₂ Ta [646], InSe ₂ Ta [647], MoP [648], NNb [649], NPd [650], NW [651] NZr [652], N ₂ Pt [653], N ₂ Ta [653], NbS [654], STa [655] STi [656], TeZr [657]
188	I ₃ LiSc [658]
189	AlHfPt [659], AlPdY [660], AlPtZr [659], Al ₂ Hf ₆ Pt [661], AsPd ₂ [139] AuInY [662], GaPtZr [659], GePdSc [663], GePd ₂ [664], GePt ₂ [665], InPdY [666] InPtSc [667], InPtY [668], MgPdY [669], NTa [670], PdTiY [671], PdYZn [672] Pd ₂ Si [673], PtSb ₂ Zr ₆ [674], Pt ₂ Si [675]
190	AlHfPt [676], AlPtZr [677], B ₄ Ga ₃ Pt ₉ [678], GaHfPd [679], GaPtZr [680], Li ₂ Sb [681], PdScSn [682]
191	Au ₂ Ba [683], Au ₅ K [684], Au ₅ Rb [684], B ₂ Mo [685], BaGa ₂ [686], BaPd ₅ [687], Be ₂ Hf [688] Be ₅ Hf [689], Be ₅ Zr [690], CaGa ₂ [691], CaHg ₂ [692], Hf [693], Hf ₂ N ₃ Ta [694], Hg [695] LiNNa ₂ [696], NNa ₃ [697], NOTa [698], NTa [699], N ₃ TaTi ₂ [700], N ₃ TaZr ₂ [700], N ₄ Ta ₂ [699], S ₂ Ti [701]
193	AgIn ₃ Zr ₅ [702], AgPb ₃ Zr ₅ [703], AgSb ₃ Zr ₅ [704], AlSn ₃ Zr ₅ [705], Al ₃ Hf ₅ [706] Al ₃ Hf ₅ N [707], Al ₃ Ta ₅ [708], Al ₃ Zr ₅ [709], Al ₄ Zr ₅ [710] AsPb ₃ Zr ₅ [711], AsSb ₃ Zr ₅ [712], AsSn ₃ Zr ₅ [713], As ₃ Ca ₅ [714], As ₃ Sr ₅ [715] BNb ₅ Si ₃ [716], BSn ₃ Zr ₅ [717], Ba ₃ N [718], Ba ₅ Bi ₃ [719] Ba ₅ Sb ₃ [719], Bi ₃ Sr ₅ [720], CSb ₃ Zr ₅ [721], CSn ₃ Zr ₅ [722], Ca ₅ Sb ₃ [723], CdPb ₃ Zr ₅ [724] Cl ₃ Ti [725, 726], Cl ₃ Zr [726, 727], GaSn ₃ Zr ₅ [728], Ga ₃ Hf ₃ Nb ₂ [729] Ga ₃ Nb ₅ [730], Ga ₃ Sc ₅ [731], Ga ₃ Ta ₅ [732], Ga ₄ Nb ₅ [733], Ga ₄ Ti ₅ [734] Ga ₄ Zr ₅ [734], GePb ₃ Zr ₅ [735], Ge ₃ Mo ₅ [736], Ge ₃ Nb ₅ [737] Ge ₃ Sc ₅ [738], Ge ₃ Ta ₅ [739], Ge ₃ Y ₅ [740], HfI ₃ [741, 742], Hf ₅ Sb ₃ Zn [743], Hf ₅ Si ₃ [744] Hf ₅ Sn ₃ [706], Hf ₅ Sn ₄ [745], Hg ₃ Mg ₅ [746], I ₃ Nb [747] I ₃ Ti [748, 749], I ₃ Zr [750], InPb ₃ Zr ₅ [751], K ₃ Nb ₈ O ₂₁ [752] Mo ₅ Si ₃ [753], NSn ₃ Zr ₅ [754], N ₆ Nb ₅ [755], N ₆ Ta ₅ [756] Nb ₅ OPt ₃ [757], Nb ₅ PSi ₃ [758], Nb ₅ Si ₃ [759], PPb ₃ Zr ₅ [760] PSn ₃ Zr ₅ [761], P ₃ Ti ₅ [762], Pb ₃ SbZr ₅ [763], Pb ₃ Sc ₅ [764] Pb ₃ SeZr ₅ [763], Pb ₃ SiZr ₅ [763], Pb ₃ SnZr ₅ [763], Pb ₃ Y ₅ [765] SSb ₃ Zr ₅ [766], SSn ₃ Zr ₅ [767], Sb ₃ SiZr ₅ [768] Sb ₃ Sr ₅ [769], Sb ₄ Zr ₅ [768], SeSn ₃ Zr ₅ [770], SiSn ₃ Zr ₅ [770] Si ₃ Ta ₅ [771], Si ₃ Y ₅ [772], Sn ₄ Zr ₅ [745]

Part 3 of Table IV:

194	Ag[773],AgAsBa[773],AgAsSr[774],AgBaBi[775],AgBiCa[776],AgBiSr[777],AlPtTi[778],AlYZn[779] Al ₄ Mg ₂ Zn ₃ [780],Al ₅ Ba ₄ [781],AsAuBa[782],AsHf[783] AsPdSr[784],AsPtSr[785],AsZr[786],AuBaSb[787],AuBiSr[787] AuCaP[788],AuBaP[789],AuCaSb[788],AuKTe[790],AuNaTe[790],AuNa ₂ Sn ₃ [791],AuRbTe[792] AuSbSr[793],AuSe[794],AuSn[795],B ₄ Mo[796] BaCdGe[797],BaGeZn[797],BaHgSn[797],AlTi ₃ [798] BaPbZn[797],BaPt[799],BaS ₃ Ta[800],BaSe ₃ Ta[800],BaSiZn[797],BaSn ₃ [801],BaTl ₂ [802] BiNa ₃ [803, 804],BiRb ₃ [805],Br ₃ RbTi[806],Br ₉ Nb ₂ Rb ₃ [807] Ca[776],CaHgPb[797],CaHgSn[776],CaHg ₃ [808] CaNa ₄ Sn ₆ [809],CaPbZn[776],CaPt ₂ [810],CaSnZn[776],CdN[811],CdS ₂ Ta[812],Cl ₃ CsSc[813],Cl ₃ CsTi[814] Cl ₃ RbTi[814], CsI ₃ Ti[815] GaTi ₃ [816],GaYZn[817],Ga ₅ Ta ₆ [818],GeMg ₂ [819],Hf ₂ PSb[820],Hf ₂ S[821],Hg ₃ Sr[822],InMg ₃ [823] InMoS ₂ [824],InTi ₃ [825] KSn ₂ [826],LiTi[827],MgNa ₂ Pb[828],MgNa ₂ Sn[829],Mg ₂ Si[830],Mg ₂ Sn[831],NNb[832] NPd[832],NPt[833],N ₂ Pt[834],N ₂ Ta[834],NaTi[835],NbS ₂ [836] NbSe ₂ [836],O ₂ [837],PSbTi ₂ [838],PSbZr ₂ [839],PTi[840],PbSrZn[841],PdTe[842] Pd ₃ Zr[843],PoSc[844],S ₂ Ta[845],SbTi[846],Sc[847],SrTi ₂ [848] B ₂ Re[849],Be ₂ Re[850],C ₂ Re[851],N ₂ Re[852], Re[853],AsLaPd[854]
205	AsGa[855],AsIn[855]
216	AgAlLi ₂ [856],AgBiLi ₂ [856, 857],AgMgSb[858],AgLi ₂ Sb[856, 857],AlBi[859],AsIn[860],AsTi[861],AuBiCa [862] AuBiLi ₂ [863],AuInLi ₂ [863],AuLiMgSn[864],AuPbY[865],BBi[861, 866],BiLiMg[867],CdLi ₂ Pb[868],CdNa ₂ Pb [869] CdPo[870],GaSb[871],GeInLi[872],GeTi ₃ [873],HgSe[874],PTl[875],HgTe[876],InSb[860] LiMgPdSb[877],LiMgPtSb [877],MoP[878],PoZn[879],CRe[880]
217	Ge ₈ Na ₆ Pt ₈ [881]
218	Al ₆ K ₈ O ₂₄ Si ₆ [882],Al ₆ Na ₈ O ₂₄ Si ₆ [883]
221	AgSc[884],AgY[885],Ag ₃ In[886],AlNTi ₃ [887],AsSc[888],AsY[889],AuSc[884],AuY[890],Au ₃ Li[891] BPbSc ₃ [892],BPd ₃ Sc[893],BPd ₃ Y[893],BPT ₃ Y[893] BaCd[894],BaHg[895],CCaPd ₃ [896],CInY ₃ [897],CTIY ₃ [898] C ₂₀ [899],Ca[900],CaTe[901],Ca ₃ NTl[902],Ca ₃ Pb[903],CdSr[904],CsIO ₃ [905],HfPd[906] Hg ₃ Zr[906],InNTi ₃ [907],InSc ₃ [908],In ₃ Y[909],MgSr[910],MoO ₃ Sr[911],NNb[912],NSc[913],PY[914],PbPd ₃ [915] PbTi[916],PdZr[917],Pd ₃ Ti[918],Pd ₃ Zr[919],PtTi[920],PtZr[921],Pt ₃ Ti[922],SbSc[888],SbTi[923],SbY[924] Se[925]
223	CaO ₄ Pd ₃ [926],CdO ₄ Pd ₃ [927],O ₄ Pd ₃ Sr[927], Pd ₃ S ₄ Y[928],PtTi ₃ [929]
224	Ag ₂ O[930]
225	AgAuCl ₆ CS ₂ [931],Ag ₂ AlSc[932],Ag ₂ InSc[932],Ag ₂ InY[933],AsIn[934] Be ₂ Si[935],BiK ₃ [936],Br ₆ Cs ₂ W[937],Br ₆ Rb ₂ W[937] CTi[938],Ca ₂ O ₆ PdW[939],CdGeLi ₂ [940],CdLi ₂ Pb[940] Cl ₆ Cs ₂ Mo[941],Cl ₆ Cs ₂ W[942],Cl ₆ K ₂ Mo[943],Cl ₆ K ₂ W[944] Cl ₆ MoTl ₂ [945],Cl ₆ Rb ₂ W[946],Cl ₆ Tl ₂ W[947],F ₂ Ti[948] F ₆ TiZr[949],GaPd ₂ Sc[950],GeHgLi ₂ [951],GeLi ₂ Pd[952] GeLi ₂ Zn[953],Hf[954],HgPo[955],HgSe[956],HgTe[957],INaO ₆ Pb ₂ [958] InP[959],InPd ₂ Y[960],InPt ₂ Sc[961],InSb[962],Li ₂ MgPb[963],Li ₂ SnZn[964] Li ₃ Tl[965],Mg ₂ Pb[966],Mo[967],OPt[968],OTi[969] OZr[970],Pd[971],Pt[972],Ti[973],Zr[974],LaN[975]
227	AgBe ₂ [976],Ag ₂ Na[977],Al ₂ Sc[978],As ₂ Na[979] AuIn ₂ Na ₃ [980],Au ₂ Bi[981],Au ₂ Na[982],Au ₂ Pb[983],BaPt ₂ [984] Be ₂ Nb[985],Be ₂ Ta[986],Bi ₂ Cs[987],Bi ₂ K[987],Bi ₂ Rb[987],CHf ₃ Zn ₃ [988] CaLi ₂ [989],CaPd ₂ [990],CaPt ₂ [991],CdLi[992] CsGe ₁₇ Na ₂ [993],CsO ₆ W ₂ [994],Ge[995],Ge ₁₃₆ K ₂₄ [996] HfMo ₂ [997],HfW ₂ [998],LiO ₄ Ti ₂ [999],LiPt ₂ [1000],LiZn[1001],Mo ₂ Zr[1002] NaPt ₂ [1003],Na ₂ RbSi ₁₇ [1004],Pd ₂ Sr[1005],Pt ₂ Sr[1005],Pt ₂ Y[1006],Sn[1007],W ₂ Zr[1008]
229	Ba[291],Ca[1009],Hf[1010],Sr[1011],Ti[1012],Zr[1013]

IV. ALL OF THE PREDICTED TOPOLOGICAL MATERIALS

We listed below all the predicted topological materials predicted by SI theory no matter whether they have clean or dirty Fermi surfaces, i.e. all the TIs from **Case 2** in Table V, all the TCIs from **Case 2** in Table VI and all the TSMs from **Case 3** in Table VII, respectively. We further list materials from **Cases 1** and **2**, but potentially with band crossings near the Fermi energy, in Table VIII.

Part 1 of all the predicted TIs:

TABLE V. All the topological insulators: Note that, due to band dispersions these materials might not be insulating in reality.

$S\mathcal{G}$	Topological insulators
2	AgF ₆ Pd., Ag ₂ F ₅ , As ₃ Ca, As ₃ Sr, BaMo ₆ S ₈ , Bi, Br ₅ W, C ₅ B, CaP ₃ , CaMo ₆ S ₈ , Mo ₃ S ₄ , Ga ₃₁ Mo ₆ , Mo ₆ S ₈ Sr, O ₁₈ Ti ₁₀ , Re, Cl ₁₄ Mo ₄ O ₄ Tl ₂ , Bi ₉ In ₆ K ₁₁ , AgO ₄ S,
10	Te ₄ TiZr,
11	Sn ₂ SrZn ₂ , Se ₃ Ta ₂ , AlAu, BBeLi, Au ₂ BaSb ₂ , CaSb ₂ , Cl ₇ CsTi ₂ , GeHfPd, HfS ₃ , MgZn ₂ , Nb ₂ Se ₃ , Mo ₂ S ₃ , NbPt ₃ , Ga ₅ Pt, Bi ₇ In ₃ Pb ₄ S ₁₈ ,
12	Al ₂ Ge ₄ Sr ₃ , Ag ₄ K ₂ Se ₃ , Al ₈ Mo ₃ , As ₃ Ba, As ₃ Sr, As ₄ Nb ₇ , Al ₂ Ba ₅ Ge ₇ , BaSb ₃ , BaTi ₄ , Au ₂ P ₃ , Ba ₂ Cd ₂ Sb ₃ , Ba ₂ Mg ₃ Si ₄ , Ba ₃ Li ₄ Sn ₈ , Bi ₁₆ I ₄ , Bi ₂ Pd, Bi ₂ Pd ₅ , Bi ₂ Pd ₃ Se ₂ , Bi ₂ Pd ₃ S ₂ , Bi ₂ HgS ₄ , Ba ₂ Hg ₃ O ₁₄ Pd ₇ , Au ₈ GaK ₄ , Bi ₂ Pb ₃ S ₆ , Bi ₄ Pb ₇ Se ₁₃ , Ba ₁₁ Bi ₁₄ Cd ₈ , Br ₄ Cs ₂ I ₂ Pd, CKN, CaGa ₄ , Cl ₃ Ti, Cl ₁₀ W ₂ , Ga ₃ Sc ₅ , Ga ₇ Rb, Hg, Hg ₂ Sn ₂ Sr, Li ₂ Si, Li ₈ Pb ₃ , Mg ₅ Si ₆ , Mg ₂ Si ₁₀ Sr ₁₁ , Nb ₂ PdSe ₆ , Nb ₂ PdS ₆ , Nb ₂ Te ₃ , Nb ₂ PdS ₅ , OTi, O ₁₃ Sr ₂ Ti ₆ , Mg ₄ Zn ₇ , P ₃ Sr, PdSe ₆ Ta ₂ , Nb ₈ PtSe ₂₀ , PtTe, P ₄ Ti ₇ , Pt ₃ Te ₄ , Sc ₂ Zr, PtSe ₇ Ta ₂ , Te, Se ₄ Ti ₁₁ , Sc ₈ Te ₃ , Cl ₂ La ₃ Si ₃ ,
13	Cl ₃ NbSe, I ₆ Nb ₂ Te ₂ , Br ₆ Nb ₂ Se ₂ , Br ₃ NbSe,
14	As ₂ Pt ₂ Sr, Ag ₂ Te, BK ₃ S ₃ , BeLiN, BaNb ₂ O ₆ , Ba ₃ P ₁₄ , B ₂ S ₃ , Au ₄ Li, As ₂ F ₈ O ₂ Rb ₂ , Bi, Cl ₂ Te ₃ , O ₃ Pb ₂ , O ₃ S, O ₂ Ti, Br ₂ O ₅ Sb ₄ , Cl ₂ O ₅ Sb ₄ , FGaO ₃ Te, Cl ₄ Hg ₄ L ₂ S, Rb ₂ S ₇ Sb ₄ , HfO ₂ , NOTa, Cl ₆ Hg ₃ S ₂ Zr,
15	MoP ₄ , O ₅ Ti ₃ , STa ₆ , Re ₂ Sc ₃ Si ₄ , Cl ₆ ReTe ₈ ,
47	Cd ₂ Zr ₃ , P ₃ Pd ₃ Sr ₂ ,
50	C,
51	AuI ₂ Te ₂ , Au ₃ Rb ₂ Tl, PtTi, AlPt ₂ , CB ₂ U, La ₂ Se ₉ U ₂ ,
52	Ca ₂ GeIn ₂ Sr, F ₇ KPdZr,
55	Al ₂ Bi ₆ Ca ₅ , C ₂ B ₂ Sc, Se ₂ Ti ₉ , O ₈ W ₃ , InLa ₂ Si ₂ , B ₄ MoU, B ₄ UW, B ₆ U ₂ W, ReSi ₂ Zr, HfReSi ₂ , Bi ₆ In ₂ Sr ₅ ,
57	STa ₂ ,
58	Ge ₆ Li ₂ Sr ₄ , Ca ₂ Ge ₃ Li, S ₂ Ti, Bi ₂ Hf, Cl ₁₆ Ti ₇ , In ₂ Se, Br ₁₆ Ti ₇ , C ₃ Al ₂ Th ₂ , Au ₈ Sn ₃ Sr ₃ , SeTi ₂ , SZr ₂ , In ₂ Te,
59	Ag ₃ Sb, Au ₃ In, Au ₃ In ₃ Sr, Au ₃ KSn ₃ , AuRb ₃ Sn ₄ , AuPb ₄ Rb ₃ , Au ₃ Lu, AuCs ₃ Pb ₄ ,
60	CW ₂ , O ₂ Pb, Au ₂ Pb, MgO ₃ Si,
61	AuSn ₂ , Bi ₂ Pt,
62	AsCdNa, AlPdY, AlPtY, As ₂ Hf, As ₂ Zr, As ₂ Hf ₃ , Ba ₂ Pb, As ₃ Sc ₅ , Ba ₂ Si, As ₃ Nb ₅ , FSeY, Bi ₃ Sc ₅ , Bi ₃ Y ₅ , GaPtY, GaPdSc, GaPtSc, GaPdY, GeHfPt, Ga ₂ Pd ₅ , PPtSc, P ₂ Zr, P ₂ Ti,

Part 2 of all the predicted TIs:

62	GeMoZr, PdSiZr, PdSiTi, PbSr ₂ , PtSiTi, PtSnSr, PtSiZr, GePdZr, Ca, GePtZr, GeZr, CaCdPd, SiZr, Sb ₂ SrZn, SiSr, CaCdPt, SiTi, Ge ₂ Mo, SrZn, Ge ₂ Li ₃ Na, Ge ₂ W, Ge ₂ InLiSr ₂ , Ge ₃ Pt ₂ , CaGePt, CaMgPd, Ge ₄ Hf ₃ Nb ₂ , PdSc ₆ Te ₂ , Ge ₄ Ti ₅ , HfNbP, SeTi ₂ , CaPbPd, CaPbPt, CaPdSn, HfP ₂ , CaPtSn, HfSi, CaPtSi, Ca ₂ Hg, HgMg ₂ , Hf ₃ P ₂ , Ca ₃ Pd, Ca ₃ GeO, Pd ₉ Si ₂ , Pb ₄ Sr ₅ , CdGeSr, CdNaSb, CdPtSr, Ca ₂ Pt ₃ Sn ₅ , Ge ₆ Sr ₇ , Mg ₂ Pb, NNa ₃ , N ₅ Ta ₃ , Mo ₄ P ₃ , NbPZr, Nb ₅ P ₃ , AuLa, PdTh, AlLaPt, AlLuPt, GaLuPd, GaLaPd, GaLaPt, GaLuPt, Se ₂ U, LaPpt, STeU, SeTeU, S ₃ U ₂ , S ₃ Th ₂ , Se ₃ U ₂ , Te ₃ U ₂ , CaSe ₅ U ₂ , S ₅ TiU ₂ , PbS ₅ U ₂ , Se ₅ U ₃ , PbSe ₅ U ₂ , Sn ₄ Th ₅ , La ₂ S ₅ U, La ₂ Se ₅ U, Te ₅ U ₃ , SrZn ₅ , Sc ₂ Te, PdTe ₂ Y ₆ , Pt ₄ Sr ₅ , TeZr ₂ , Ba ₇ Ge ₆ , Pt ₃ Sr ₇ , GePdTi, AlAuCa, HfPdSi, HfPtSi,
63	AlBMo, Ag ₂ Si, AlBW, AlSc, AlY, AgS ₃ Ta, As ₂ BaPd, AlHf ₃ N, AuIn ₂ Na, AuClTe ₂ , BNb, B ₂ Ta, BaCd ₂ Pt, BaIn, As ₃ Nb ₄ , BaIn ₂ Pt, BePd ₃ , BaZn ₅ , Ba ₃ Ge ₅ , B ₇ WY ₃ , Ba ₃ Sn ₅ , CB ₃ Nb ₃ , CaSi, CaZn, Cd ₂ PdSr, CaIn ₄ Pd, Ca ₂ Sn ₆ Zn ₃ , GaSc, Ga, GaY, GeNa ₂ Zn, Ge ₂ Hf, HfPd, HfSi ₂ , InSb, HfTe ₅ , In ₄ PdSr, In ₄ PbSr ₃ , Mg ₂ PdSr, In ₂ PtSr, In ₄ PtSr, PdZr, Pd ₃ Ti ₂ , Si ₂ Zr, SiZr, SnTi ₃ , Sn ₄ Sr, TiZn ₁₆ , Tl ₅ Y ₃ , Sn ₅ Sr ₃ , Mo ₉ Se ₁₁ , U, AuLa, GaLu, GaLa, PtTh, Ge ₂ U, Sn ₂ Th, Ge ₂ Th, BNU, AlLa, Te ₃ U, LiLuSn ₂ , LaLiSn ₂ , La ₂ SnZn ₅ , GaU, In ₅ La ₃ , Lu ₃ Tl ₅ , Ge ₆ La ₂ Zn ₃ , O ₈ U ₃ , Al ₂ BaSi ₂ , BaPdSb ₂ , Te ₅ Zr, As ₄ Cd ₅ Rb ₂ , Ge ₈ Na ₁₅ PSn,
64	As, AgNO ₃ , Ba ₂ Bi ₄ Cd ₃ , Cs, Ga, Ge, K, Rb, Pd ₈ Sn ₂₄ , PdSn ₃ , LiTl, Sn ₃ Ti ₂ , C ₂ B ₂ Mg, Br ₁₆ W ₆ , Ba ₂ Ca ₂ Sn ₆ ,
65	Al ₂ Ti, Ag ₃ Te ₂ Tl, CBY, Ga ₂ Zr, Ga ₂ Sc, HfPd ₅ , Li ₇ Sn ₂ , Br ₂ Cd ₂ Hg ₂ S ₂ , Ba ₃ Ge ₄ , Ge ₂ U, Ge ₂ Th, LaSn ₂ , AlB ₄ Lu, Ge ₂ PbSr ₂ , PZr ₂ ,
66	I ₃ Th,
69	Be ₂ Zn, Si ₂ Ti, Cs ₂ Pt ₃ Se ₆ U, Cs ₂ Pt ₃ S ₆ U,
70	NbSn ₂ , Si ₂ Ti, Sn ₂ Zr, SbSnTi, Rb, Sn ₂ Ta, P ₂ S ₇ U, Ge ₂ Ti,
71	Al ₂ Ba ₃ Ge ₂ , Al ₂ Ba ₃ Si ₂ , Al ₂ Ba ₃ Sn ₂ , Al ₂ Ca ₃ Si ₂ , Al ₂ Si ₂ Sr ₃ , Ag ₃ Ga ₈ Y ₃ , AsTeTi, Al ₂ Ge ₂ Sr ₃ , Al ₂ Sn ₂ Sr ₃ , CdO ₆ Pt ₃ , Ca ₃ Ga ₈ , Mo ₃ Ti, MoPt ₂ , Ga ₉ Pt ₂ Y ₃ , Pt ₂ W, Ge ₅ Ti ₆ , Hf ₂₇ P ₁₆ , C ₃ Si ₂ U ₃ , Te ₂ U, Nb ₆ Sn ₅ , N ₂ Re, Sn, Pd ₂ Ti, Br ₂ Ca ₃ Si,
72	Ga ₂ Mg ₅ , In ₂ Mg ₅ , Pb ₅ Sc ₆ , Br ₂ Hg ₅ O ₄ ,
73	AlAs ₂ Li ₃ , Bi ₃ K ₃ Na ₂ Sn,
74	Au ₂ Ca, Ag ₂ Ca, Ge, BaIn ₂ , Si, Ba ₂ O ₇ U ₂ ,
82	AsPd ₃ , GeTi ₃ , Mo ₃ P, TeZr ₃ , SbZr ₃ , GeTa ₃ , Te ₃ Tl ₅ , PW ₃ ,
85	Se ₂ U,

Part 3 of all the predicted TIs:

86	GeTa ₃ , GeNb ₃ , Nb ₃ Si,
87	Se ₄ Ti ₅ , As ₄ Mo ₅ , Te ₄ Zr ₅ , Hf ₅ Te ₄ , O ₅ Ti ₄ , Te ₄ Ti ₅ ,
88	CaO ₄ Se, GeO ₄ U, Pd ₂ S ₄ U, O ₂₄ Re ₄ Sr ₁₁ ,
113	GaNb ₄ S ₈ ,
114	Pd ₄ S,
118	B,
121	Ag ₂ S ₄ SnZn, Mo ₃ P, AuPb ₃ , AsHgS ₃ Tl,
122	As ₂ SnZn, AgInSe ₂ , As ₂ CdGe, As ₂ CdSn, CdSb ₂ Sn, F ₅ U,
123	BiLi, BiNa, ClNa ₃ , HgTi, ClNa ₂ , MgPt ₃ , AgPPd ₅ , BaGe ₃ Mg ₄ , Pd ₅ Ti ₃ , Hf ₅ Pb, As ₂ BaOTi ₂ , HgZr, MoPt ₃ , N ₃ Rb,
125	Pb ₄ Pt,
127	CdGe ₂ Y ₂ , Ca ₂ Ge ₂ Sn, CsI ₃ Sn, Hf ₃ In ₄ , GaPt ₃ , AlPt ₃ , B ₄ Y, Pt ₃ Si, B ₄ La, B ₄ U, B ₄ Lu, Si ₂ Th ₃ , CB ₂ Lu, In ₄ Ti ₃ ,
129	CdTi, Sc, SeTi, HfSb ₂ , AgSb ₂ Y, BaGeMg, BaMgSn, CaGaN, BaSn ₂ Zn ₂ , Al ₂ Au ₂ Sr, Au ₂ Sn ₂ Sr, Be ₂ CaGe ₂ , AsPU, OTeU, Bi ₂ LaLi, AuLaSb ₂ , Ge ₂ Pt ₂ U, Ge ₂ Pt ₂ Th, AgLaSb ₂ , CaGa ₄ ,
130	Ca ₅ Ge ₃ , Ba ₅ Si ₃ , Ga ₃ Y ₅ ,
131	IPdTe, F ₆ PbSr, CaO ₄ Pt ₂ ,
133	PTa ₃ ,
135	Cs, CB ₂ Lu, CB ₂ Sc,
136	Cd ₄ Pt ₂ Sr, BaCd ₄ Pt ₂ , Al ₂ Y ₃ , Li ₂ Sr ₃ , BaHg ₂ Tl ₂ , BaHg ₂ Tl ₂ , Ag ₅ CsTe ₃ , Ag ₅ CsSe ₃ , Al ₂ Zr ₃ ,
137	Ba ₂ S ₆ U,
139	Ag ₂ Zr, Au ₂ Be, Au ₂ Hf, Bi ₂ Pd, CdHg ₂ , Hg ₂ Mg, CaGe ₂ Zn ₂ , CaP ₂ Pd ₂ , Au ₂ CaSi ₂ , Au ₂ Zr, BaGe ₂ Mg ₂ , Be ₁₂ W, Ge ₂ SrZn ₂ , Be ₁₂ Mo, BaCd ₂ Ge ₂ , Cd ₂ Hg, Ga ₃ Zr, Cd ₂ Ge ₂ Sr, Pd ₂ Zr, PdZr ₂ , Hf ₂ Pd, Hg ₂ In ₂ Sr, Pd ₂ Ti, P ₂ Pd ₂ Sr, Au ₂ Si ₂ Sr, InPd ₃ , In ₃ Zr, Pt ₈ Ti, Bi ₁₀ Ca ₁₁ , C ₂ PtU ₂ , Al ₂ Pd ₅ U, GeTeU, LaSbSc, GeSeU, La ₂ O ₄ Pd, LuSbZr, O ₂ TeU ₂ , Pt ₂ Si ₂ U, SeSiU, La ₂ Sb, PdTi ₂ , Au ₂ Ge ₂ Sr, Cd ₂ Ga ₂ Sr, MgPd ₃ , BaBi ₄ Br ₂ O ₆ ,
140	Sc, Sb, BeTa ₂ , Hf ₂ Si, SiZr ₂ , Pb ₂ Pt, Sb ₂ Ti, SiTa ₂ , SbTi ₃ , B ₂ Mo ₅ Si, In ₅ Sb ₃ , Ga ₃ Ta ₅ , Bi ₃ In ₅ , Si ₃ Sr ₅ , Sn ₃ Sr ₅ , SiU ₃ , BaTe ₅ U ₂ , PtTl ₂ , Ge ₃ Sr ₅ ,
141	AgLi, Si, Sn, PTa, BW, Ga ₂ Hf, S ₂ Zr ₉ , Ag ₈ O ₄ S ₂ Si, PbU, Ga ₂ Th, Ge, NbP, GaZr, In ₂ Zr, ScSn ₂ , Al ₂ Ti,
142	Au ₃ Zn,

Part 4 of all the predicted TIs:

147	Ge ₉ Pd ₂₅ , Os ₈ U ₃ , Au ₇ In ₃ ,
148	Bi ₂ STe ₂ , Mo ₃ Se ₄ , Cl ₁₂ N ₅ Sc ₇ , Bi ₁₄ S ₈ Te ₁₃ ,
162	Ag ₆ O ₂ , Cl ₄ Mo,
164	Be, Ag ₂ O, CNb ₂ , CaGe ₂ , CTa ₂ , BaSn ₂ , CaSi ₂ , CNb ₂ S ₂ , Bi ₂ Mg ₃ , CS ₂ Ta ₂ , Bi ₂ Li ₃ Y, Bi ₂ Pb ₂ Se ₅ , As ₄ GeTe ₇ , Bi ₄ SnTe ₇ , As ₂ Ge ₅ Te ₈ , Cl ₈ Nb ₃ , C ₆ N ₆ PtRb ₂ S ₆ , C ₆ K ₂ N ₆ PtS ₆ , Bi ₈ Se ₇ , Ge ₂ Sr, PdTe ₂ , PtTe ₂ , SiTe ₂ , GeSb ₄ Te ₇ , Sb ₂ Te ₂ , Te ₆ Zr ₅ , Sb ₂ Te,
166	As, CaSi ₂ , GaP, CS ₂ Ta ₂ , In ₂ Te ₃ , GaGeTe, CY ₂ , STi, Bi ₂ GeTe ₄ , Ga ₂ Te ₃ , Sb, S ₂ Ta, SeTi, As ₂ Sn ₂ Sr, N ₂ W, As ₂ CaGa ₂ , Bi ₂ PbTe ₄ , AgGeLi ₂ , PtTe, Bi ₂ Se ₃ , Bi ₂ SeTe ₂ , SbTe ₂ Tl, Bi ₂ Te ₃ , CaGe ₂ , Sb ₂ SeTe ₂ , Sb ₂ Te ₃ , Li ₈ Pb ₃ , Sb ₂ SnTe ₄ , C ₃ Al ₆ N ₂ , Ba ₂ Mg ₁₇ , Nb ₆ Zn ₇ , C ₅ Ti ₈ , As ₂ Ge ₄ Te ₇ , Pt ₂ Te ₃ , Cl ₈ Na ₂ Ti ₃ , Sb ₈ Te ₃ , Al ₁₀ Ba ₇ , Bi ₆ PbTe ₁₀ , Bi ₈ Te ₉ , Sb ₄₈ Te ₉ , ClLa,
167	Pd ₈ Sb ₃ , Mo ₁₅ Se ₁₉ , Mo ₁₅ Se ₁₉ Tl ₂ , Cd ₂ Mo ₁₅ Se ₁₉ ,
176	Ba ₄ Nb ₂ O ₉ ,
191	B ₂ Sr, BaSi ₂ , CaSi ₂ , Li ₂ Pd, CaZn ₅ , Li ₂ Pt, CaPd ₅ , BaSn ₅ , Ti, FN ₃ Ta ₂ , Ti ₂ Zr,
193	Ca ₁₀ Ge ₃ Pt ₇ , Ca ₁₀ Pt ₇ Si ₃ , Pb ₃ TeZr ₅ ,
194	Zn, SnTi ₃ , ScZn ₂ , TaZn ₂ , AgSbSr, AlN ₃ Nb ₄ , AuBaBi, CNb ₂ Sn, CNb ₂ S, Cd, BaSe ₃ Ti, Ca ₂ IN, InPt ₂ Y, CaGaSn, Mg ₁₇ Sr ₂ , Ca ₄ Mg ₁₃ Zn ₂₉ , Pt ₂ SnU, LuMg ₂ , Re ₂ Y, AlN ₃ Ti ₄ , Al ₂ Hf, C ₂ AlTa ₃ , MgPo, SiSr ₂ ,
200	Cl ₇ Na, Mg ₂ Zn ₁₁ , Cd ₁₁ Na ₂ ,
204	BaGe ₁₂ Pt ₄ ,
205	AgPd ₃ Se, N ₂ W, PdSb ₂ , S ₂ Ti,
206	Cd ₃ N ₂ , N ₂ Zn ₃ ,
215	Au ₉ In ₄ ,
216	AgKO, AgN, AgNaO, AgORb, AuGaLi ₂ , HgS, InN, N ₂ Tl, Pd ₁₇ Te ₄ , Au ₁₀ Mo ₄ Zn ₈₉ , PtSnU, Pt ₅ U, InLaPt ₄ , NRe,
221	MgPd, PbSe, SnTe, AlSc, AlY, B ₆ Ba, B ₆ Ca, B ₆ Sr, BeTi, Br ₃ CsGe, Br ₃ CsPb, CsI ₃ Sn, Sn ₃ U, HgTi ₃ ,
223	BiNb ₃ , HgTi ₃ , HgZr ₃ , Nb ₃ Sb, SbTa ₃ , SbTa ₃ ,
225	HgP ₂ Si, W, N ₂ Pd, Li ₂ MgSi, Y ₆ Zn ₂₃ , In ₇ Sr ₁₁ , BiY, CPd, CZr, Ca ₇ Ge, Ca ₃ Cd ₈ Pt ₄ , BiLu, BiLa, SeU, NPa, LaP, GeTh, LaSb, TeU, Ga ₄ In ₃ Sr ₁₁ , AsLa,
227	CTi ₂ , CTi, In ₂ Mg, Se, Hf ₂ Pd, Hf ₃ N ₂ Zn ₃ , Al ₁₈ Mg ₃ W ₂ , Al ₁₈ Mg ₃ Mo ₂ , C ₃ Nb ₈ Zn ₄ , Al ₂ Th, CNb ₄ Zn ₂ ,

Part 5 of all the predicted TIs:

229	Be,
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Part 1 of all the predicted TCIs:

TABLE VI. All the topological crystalline insulators: Note that, due to band dispersions these materials might not be insulating in reality.

<i>SG</i>	Topological crystalline insulators
2	AsF ₆ N ₂ S ₃ , Br ₃ Ti, Cl ₁₈ Mo ₂ P ₂ , Cl ₅ Mo, CsHg, Cl ₉ TeW, HgK, K ₃ Nb ₇ O ₁₉ , Mo ₆ Se ₈ Ti, O ₄ PbPt ₂ , STa ₆ , O ₂₀ SrTi ₁₁ ,
11	Sb ₂ Sr, Se ₃ Ta, BaBi ₂ Pd ₂ , BaSb ₂ , Bi ₂ Pd ₂ Sr, Li ₄ S ₄ Si, MoTe ₂ , Pt ₆ Si ₅ , Pt ₃ Ta, Ba ₃ Ge ₂ N ₂ ,
12	As ₂ Nb, As ₂ Ta, Al ₁₄ Ca ₁₃ , As ₃ Mo ₂ , As ₃ W ₂ , As ₄ Ba ₃ Zn ₂ , As ₄ Zr ₇ , Al ₄ Na ₄ P ₁₂ Sr ₈ , As ₄ Hf ₇ , AsF ₆ NO ₂ , Al ₄ Cl ₅₁ Zr ₁₂ , BaPt ₂ Sb ₂ , Ba ₃ Cd ₂ Sb ₄ , BiHf ₂ , BiSe, BiBr, Bi ₂ ITe, C ₅ Nb ₆ , ClZr, Br ₅ W, Cl ₈ NSc ₅ , CdK ₆ Pb ₈ , Hf ₂ Te, Hf ₇ P ₄ , In ₄ Sr, LiMoO ₂ , NbP ₂ , NbSb ₂ , Nb ₂ Se, Nb ₇ P ₄ , O ₅ Ti ₅ , P ₄ Zr ₇ , Pt ₂ Te ₃ , Sb ₂ Ta, Se ₄ Ti ₃ , Ta ₂ Te ₃ , Te ₄ Ti ₃ , Se ₃ Ti ₈ , LaSi ₅ , Ge ₂ Re, I ₃ La ₅ Si ₅ ,
13	FMo ₂ O ₇ Y,
14	AsSeY, AsSY, LaSbSe, AsLuSe, K ₂ O ₇ W ₂ , O ₇ Si ₂ Y ₂ , O ₇ Rb ₂ W ₂ , O ₇ P ₂ Sn ₂ ,
15	P ₂ Pt ₅ , Sb ₂ Te ₃ , Na ₆ Sb ₄ Tl, Pb ₉ Pd ₁₃ ,
47	OTa ₄ , MoO ₃₆ W ₁₁ ,
51	CdMg, BiPd ₃ , MoPt, PdTi, GaPt ₂ , BLi, C ₃ AlY ₃ , O ₅ U ₂ , Ca ₅ P ₆ Pd ₆ ,
55	Ca ₅ Ga ₂ Sb ₆ , Cd ₇ Th ₆ , B ₆ ReY ₂ , B ₆ ReSc ₂ , Ga ₂ Mg, Bi ₈ Ca ₃ Pd ₄ , C ₅ Y ₄ ,
57	Ca ₃ Ga ₂ Pd ₂ , AlLu, Ca ₃ Ga ₂ Pt ₂ ,
58	Bi ₃ RbS ₅ , STi ₂ , P ₉ Zr ₁₄ , AsTa ₂ ,
59	BrNTi, Ba ₆ Ge ₅ N ₂ , INTi, PdSiY,
61	O ₂ U,
62	BiI ₃ , Ga ₅ Y ₃ , PSc ₃ , PdSn, PdSi, Pd ₂ Sn, PtSc ₂ , GePd, GePt, Sb ₃ Sc ₅ , CaTe, Ge ₂ Pt ₃ , Ca ₃ Hg, HgSr ₃ , In ₅ Y ₃ , Ca ₇ Ge ₆ , MgSi ₂ Sr, MoPt ₃ Si ₄ , SiU, LaSbTe, Te ₅ U, Ga ₅ Lu ₃ , In ₄ La ₂ Pd ₃ , Lu ₅ Sb ₃ , PtY ₂ ,
63	AlGeSc, AlSiY, AsIn, AuY, BaGe, BaSi, BaSn, BaSi ₆ , Bi ₂ Ca, Au ₃ Mg, CaGe, CaIn ₂ Pd, CaIn ₂ Pt, Ba ₃ Pb ₅ , CaSn, CaPdSn ₂ , Ca ₃ Zn, Ge ₂ Pt ₃ , HgTe, In ₂ PdSr, Cd ₂ FSb ₅ Sr ₅ , PdSrTl ₂ , PbSr, SnSr, Pd ₃ Te ₂ , Si ₂ Ti, Si ₆ Sr, Ba ₅ Cd ₂ FSb ₅ , AlGeLu, AlLuSi, N ₃ TaTh, La ₂ Li ₂ Si ₃ , La ₂ PbZn ₅ , Ge ₃ La ₂ Li ₂ , La ₃ Tl ₅ , Al ₂ GeLa ₂ , CsScSe ₅ U, Al ₄ Mg ₁₉ Zn ₁₅ , BaPb, Ca ₂ InN, In ₅ Y ₃ ,
64	BiSn, Ba ₂ Ge ₄ Pd ₅ , Li, Ca ₅ Ga ₂ N ₄ , LaS,
65	INaO ₃ , Au ₇ Rb ₃ , Ba ₃ Nb ₁₆ O ₂₃ , Ba ₄ Nb ₁₄ O ₂₃ , La ₂ Sn ₅ , In ₉ La ₁₁ Pd ₄ , OTi ₂ Zr, Ga ₁₃ Nb ₅ ,
69	Ag ₂ Ca ₄ Si ₆ , Bi ₂ CaNb ₂ O ₉ , Ge ₆ Li ₂ Sr ₄ , K ₂ Pd ₃ S ₆ U, Pd ₃ Rb ₂ Se ₆ U, Cs ₂ Pd ₃ Se ₆ U,
71	Al ₂ Ca ₃ Ge ₂ , Ca ₂ CdPd ₂ , Ca ₂ MgPd ₂ , Ca ₂ MgPt ₂ , HgO ₆ Pt ₃ , Ge ₂ PtY, Li ₄ Sb ₄ Sr ₃ , Al ₄ OSi ₆ Sr ₁₀ , B ₄ Ti ₃ , Ba ₃ Bi ₄ Li ₄ , Ba ₃ Li ₄ Sb ₄ , Ba ₃ CdHg ₁₀ , Sn ₅ Ti ₆ ,
72	Pt ₃ Sb ₂ , Mg ₅ Tl ₂ , Pt ₅ Ti ₃ , Ge ₅ Ti ₆ ,

Part 2 of all the predicted TCIs:

73	Alli ₃ P ₂ ,
74	BaCd ₂ , CaCd ₂ , Hg ₂ Sr, BaZn ₂ , CaZn ₂ , BaHg ₂ , SrZn ₂ , Cd ₂ Sr, BaGe ₅ ,
84	P ₂ S ₆ U,
85	P ₂ U,
86	SiTa ₃ ,
87	Au ₄ Ti,
88	O ₄ PbPd ₂ , P ₄ S ₁₂ U,
123	AsNa, CdHg ₂ Ti, Pd ₃ Sn, Pb ₃ Sr, CPd ₃ Sn, As ₃ RbZn ₄ , Pt ₅ SiSn, As ₃ CsZn ₄ , BaOSb ₂ Ti ₂ , AgSbTe ₂ ,
127	Pb ₃ Sr ₂ , Li ₂ Sn ₅ , B ₄ Ca, Si ₂ U ₃ ,
129	GeSZr, GeNbSb, SnTeZr, OSiZr, SeSiZr, SSiZr, SiTeZr, HfSSi, GeSeZr, HfSeSi, GeHfSe, GeHfS, GeHfTe, AsGeNb, BaPd ₂ Sb ₂ , Pd ₂ Sb ₂ Sr, Bi ₂ Pd ₂ Sr, Au ₂ Ga ₂ Sr, BaMg ₂ Pb ₂ , BaMg ₂ Sn ₂ , CsF ₄ Ti, BiO ₃ Te, In ₉ Li ₂ Y ₅ , Al ₂ Au ₂ Th, As ₂ U, As ₂ PdU, GeSU, P ₂ U, SSiU, SnTeU, Sb ₂ U, Pt ₂ Si ₂ Th, LaSbTe, PdSb ₂ U, HfSiTe,
136	Al ₂ Hf ₃ , Al ₂ Lu ₃ ,
137	Ba ₂ LiN,
139	As ₂ Pd ₂ Sr, As ₂ CaPd ₂ , BePd ₂ , Ba ₂ Zn, CaGe ₂ Pd ₂ , Au ₂ CaGe ₂ , AsTiZr, Ba ₂ Cd, BaPd ₂ Sb ₂ , Ba ₂ Hg, AsCa ₂ , CaPd ₂ Si ₂ , Al ₃ Hf, Pd ₂ Sb ₂ Sr, ZnZr ₂ , Ag ₂ BaSn ₂ , Hf ₂ Hg, Br ₂ Ca ₃ Si, BiSr ₂ , AsBa ₂ , SbZr ₂ , Pd ₂ Si ₂ Sr, Ga ₄ Ti ₂ Zr, SbYZr, CaIn, MoO ₄ Sr ₂ , Ba ₂ Bi, SbSr ₂ , Bi ₂ F ₂ OSr ₂ Ti ₂ , As ₂ F ₂ OSr ₂ Ti ₂ , CaSi ₃ , Si ₃ Y, Ba ₂ Sb, F ₂ OSb ₂ Sr ₂ Ti ₂ , Ca ₂ Pd ₃ Sb ₄ , Al ₂ Ge ₈ Sc ₁₁ , Ga ₁₀ Hf ₁₁ , Au ₂ Si ₂ U, Ge ₂ Pd ₂ Th, Ge ₂ Pt ₂ Th, Ge ₂ Pt ₂ U, ThZn ₄ , GeLaSc, Pd ₂ Si ₂ Th, LaScSi, Pt ₂ Th, PTeU, Pt ₂ Si ₂ Th, O ₄ Te ₃ U ₄ , Ge ₄ In ₆ La ₁₁ , Ti ₂ Zn, Hf ₂ Zn, CdHf ₂ , Ag ₂ BaGe ₂ , BaSi ₂ , Ca ₂ Sb, K ₂ Mg ₅ Sn ₃ , Mo ₃ Sb ₇ ,
140	Bi, Mg ₂ Pt, MoO ₃ Sr, GePt ₃ , GeNb ₃ , Ca ₅ Hg ₃ , Cd ₃ Sr ₅ , Ga ₂ Sc ₃ , Ga ₂ Y ₃ , Ga ₂ Lu ₃ , Lu ₇ Sb ₃ ,
141	Al ₂ Mg,
147	Bi ₂ Pt,
148	Mo ₆ S ₈ , Mo ₁₈ S ₂₂ Tl ₄ , Mo ₃ S ₄ ,
164	BaSi ₂ , CW ₂ , B ₂ O, Bi ₂ Pb ₂ Te ₅ , Bi ₂ Se ₂ , BiTe, Bi ₃ STe ₂ , CdO ₄ S, Te ₂ Zr, HgPt ₂ Se ₃ , AllLaSi ₂ ,
166	Bi, B ₂ Mo, ClZr, Hg, CNb ₂ S ₂ , BrZr, P, Ba ₃ O ₉ Sc ₄ , B ₄ Mo ₂ , AsNaTe ₂ Zr ₂ , Ag ₄ Sb ₂ Sr, TeZr ₃ , Ga, As ₃ Cd ₄ Na, As ₃ Cd ₄ K, Pd ₃ S ₂ Tl ₂ , Bi ₄ Se ₃ , As ₃ Cd ₄ Rb, Pt ₃ Te ₄ , Bi ₈ Se ₉ , BrLa, C ₆ Al ₄ Hf ₃ ,

Part 3 of all the predicted TCIs:

176	Mo ₉ Se ₁₁ , Mo ₁₅ S ₁₉ ,
187	CHf, NbSe ₂ , NY, InNbS ₂ , PPTy, InNbSe ₂ , Br ₂ Ca ₃ Si, LuPPt,
189	AgGeSc, CaPbPd, CaCdPb, AgPbY, AgAsCa, GaMgY, MgTiY, AlMgY, GePdTi, CaCdGe, CaCdSn, GeLiY, InMgY, BLiPt ₃ , Rb ₁₅ Tl ₂₇ , CsRb ₁₄ Tl ₂₇ , InLaPt, AsLuPd, AuCdLa, Ge ₃ La ₂ Zn ₆ , LaMgTl, AgCaP, AgMgY, AuGaMg, AgSiY, LiSiY, OTi, Pt ₅ Th ₃ , PtSnU, Pd ₅ Th ₃ , Se ₂ U, GaLaMg, AgLuSi, AgLaMg, O ₈ U ₃ ,
191	B ₂ Mg, B ₂ Ti, B ₂ Ca, B ₂ Zr, C ₂ Ca, Ga ₂ Sr, Si, Pd ₅ Sr, Be ₁₂ Ti,
193	Pb ₃ SZr ₅ , NbSb ₅ U ₃ ,
194	SnTi ₂ , AlLi, AsHgK, B ₂ W, C, CGeNb ₂ , CCdTi ₂ , CdNa ₂ Sn, HgKSb, BaGaGe, Cs ₃ I ₉ Mo ₂ , Mg ₄ Sr, ILa, I ₂ Th, Hf ₉ Re ₄ Se, Hf ₉ Re ₄ S, AsPtY,
204	Al ₁₂ Mo, Al ₁₂ W, NPd ₃ ,
221	NY, NTi ₃ Tl, PbPt ₃ , Pt ₃ Sn, Pt ₃ Zn, AgGa, AgIn, AgLi, AlAu, CPbPd ₃ , CPt ₃ Sn, C ₃ Nb ₄ , CaPd, Ca ₃ GeO, Ca ₃ OPb, HfPd ₃ , HgPt ₃ , CTh, LaN, N ₃ TaTh, SiU ₃ , Ca ₃ OSn, OSnSr ₃ , OPbSr ₃ , Ba ₃ OPb,
225	PbPo, SSn, SbSc, SeSn, SnTe, Ag ₂ MgZn, AlAu ₂ Sc, Al ₂ O, AsSc, Au ₂ InSc, Au ₂ InY, B ₁₂ Hf, Au ₂ Cl ₆ Cs ₂ , Ba, Bi ₃ , BiSc, CPt, Ca, Au ₂ InLu, B ₁₂ Th, O ₂ U, LuSb, CW, Al ₁₆ Pt ₇ Zr ₆ ,
227	Al ₂ Sr, Al ₂ Ba, S ₂ Ti, Pd ₁₃ Te ₃ , Mo ₂ O ₇ Y ₂ , Ba ₂₁ O ₅ Si ₂ , La ₂ O ₇ Zr ₂ , Cd ₂ O ₇ Re ₂ , HfZn ₂ , NPd ₂ Zr ₄ ,

Part 1 of all the predicted **Case 3**-TSMs:

TABLE VII. All the topological (semi-)metals from **Case 3**.

SG	Topological (semi-)metals
2	AgF ₁₁ NaZr ₂ , AgBi ₂ F ₁₂ , AgF ₆ Sn, AgF ₁₂ Sb ₂ , AgF ₆ Ti, AgF ₁₂ Ta ₂ , As ₁₀ Cs ₁₃ In ₆ Nb ₂ , Ba ₁₄ CaN ₆ Na ₁₇ , Cl ₆ ISe ₆ W, Cl ₈ NW ₂ , InMo ₆ S ₈ , I ₁₀ Ta ₇ Te ₂₄ , Cl ₁₂ ReTe ₂ , Se ₂ Ta,
4	Ge ₂ Pt ₂ Y,
5	F ₁₁ I ₂ Sb ₂ , NbS ₂ , I ₄₇ W ₁₅ ,
6	Mo ₈ P ₅ ,
10	AuCd,
11	S ₃ Ta, BeLi, CBrHgNS, Bi ₉ I ₂ , Br ₉ TeW, Li ₇ Sn ₃ , Ge ₆ Pt ₄ Y ₃ , Mo ₂ S ₂ Sb, NbS ₃ , Pd ₃ Ta ₃ Te ₁₄ , N ₂ Re, CBCl ₃ La ₃ ,
12	AlMg ₄ Si ₆ , AgMo ₆ Te ₆ , Al ₃ Si ₂ Y ₂ , AgBi ₆ S ₉ , Al ₄ Li ₉ , Ag ₃ F ₁₄ Hf ₂ , As ₄ Na ₅ , Bi ₈ I ₃ Pt ₅ , Cl ₅ Y ₄ , CCl ₈ Sc ₅ , C ₂ Cl ₁₀ Sc ₇ , C ₂ I ₇ Y ₆ , Cl ₁₀ Sc ₇ , Ba ₁₄ CaN ₆ Na ₂₁ , Cl ₈ Sc ₅ , Cl ₆ O ₂ TiW ₂ , CsSe ₈ Ti ₅ , CsTe ₈ Ti ₅ , Ga ₃ Pd ₇ , Ga ₅ Pd ₁₃ , InPt, KSe ₈ Ti ₅ , K ₅ Sb ₄ , In ₉ Pt ₁₃ , Mo ₂ O ₁₂ Y ₅ , NaSe ₈ Ti ₅ , NbTe ₂ , Nb ₅ PbSe ₈ , Nb ₅ Se ₈ Sr, Nb ₅ Se ₈ Sn, Na ₃ O ₁₃ Ti ₆ , O ₃ Sr ₂ Tl, RbSe ₈ Ti ₅ , S ₇ Y ₅ , TaTe ₂ , Se ₈ Ti ₅ Tl, P ₄ Re ₃ , In ₂₁ Pd ₁₀ Th ₄ , O ₆₄ P ₈ Rb ₂ W ₁₆ , N ₂ Re,
13	F ₆ ISbSe ₆ ,
14	MgP ₄ , F ₄ Xe, CdP ₄ , InS, NS, F ₄ Na ₂ Pd, Cl ₂ PdSe ₆ , F ₆ Li ₂ Pt, ClI, Br ₆ Pb ₂ Pd, O ₆ Se ₂ Sn, Cl ₆ Pb ₂ Pd, F ₆ Na ₂ Sn, C ₂ Li ₂ O ₄ , C ₂ CdO ₄ , C ₆₀ Na ₂ Rb, N ₂ O ₄ , F ₈ Sn ₃ , C ₂ Na ₂ O ₄ , O ₃ Rb, F ₈ Ge ₃ , C ₂ Ag ₂ O ₄ , K ₂ MgP ₂ Se ₆ , CdP ₂ Rb ₂ Se ₆ , C ₂ O ₄ Tl ₂ , Cl ₈ PtS ₂ , Cl ₃ MoO, Cs ₂ I ₈ , C ₄ Na ₂ O ₄ , Cl ₆ HfHg ₃ Se ₂ , Al ₂ Cl ₈ Ti, AuBr ₄ Rb, AuGa ₂ , Al ₂ Cl ₈ Pd, Au ₃ F ₈ , Au ₄ Ca ₅ , AgP ₂ , Ag ₃ O ₄ , B ₂ F ₄ , BBiO ₃ , AsF ₆ N ₂ S ₃ , As ₂ La, Ge ₂ LaPt ₂ , O ₂ Re,
15	LiO ₆ Si ₂ Ti, NaO ₆ Si ₂ Ti, RbTe ₆ , BaI ₄ La, I ₄ LaSr, O ₆ Re ₂ Sb, BiO ₆ Re ₂ ,
19	P ₇ Th,
20	Rb, Cs,
25	C ₇ B,
29	N ₂ Re,
33	I ₁₁ Nb ₆ ,
36	AsPb ₂ Pd ₃ , AsF ₉ S, CaI ₄ N ₃ O,
39	LaS,
43	Al ₃ Hf ₂ , Al ₃ Zr ₂ , Ga ₃ Zr ₂ , Ga ₃ Hf ₂ , Ge ₅ Y ₃ , Cl ₁₂ ReSe ₂ , Ba ₅ P ₉ ,
44	C ₅ B, LiO ₃ , NaO ₃ , Ca ₂₈ Ga ₁₁ , Al ₄ La, Lu ₇ Pd ₂ Te ₂ ,
47	NbO,
51	AuCd, AuTi, NbPt, AsNb ₂ , CsTe ₅ TiU, CsTe ₅ UZr, CB ₂ N, FLiNb ₆ O ₁₅ , Nb ₂ P,

Part 2 of all the predicted **Case 3**-TSMs:

52	Ag ₂ BiO ₃ , Bi ₃ Sr ₂ ,
55	Al ₃ Pd ₅ , Al ₃ Pt ₅ , In ₃ Pd ₅ , In ₄ Pd ₂ Y ₅ , Bi ₉ Ca ₉ Cd ₄ , In ₉ Pb ₄ S ₁₇ , Bi ₉ Cd ₄ Sr ₉ , In ₅ S ₁₃ Y ₄ , In ₄ Lu ₅ Pd ₂ , In ₅ La ₄ S ₁₃ , Ga ₃ Pd ₅ , Cl ₆ NSc ₄ , Bi ₉ Ca ₉ Zn ₄ , BCl ₆ Sc ₄ , Ca ₉ Sb ₉ Zn ₄ , KNb ₈ O ₁₄ ,
56	Cl ₆ ReSe ₄ ,
57	AlCaPd, Cs, BiK ₂ Sn, Al ₃ Ca ₄ Mg, GaHf, Hg ₇ K ₅ , InTh, ThTl,
58	BPd ₂ , AuN ₂ , LiO ₂ , AlAu ₂ , NPd ₂ , LiO ₂ Tl, NaO ₂ , Hf ₂ P, Ba ₈ PdSe ₁₆ U ₂ , Nb ₅ O ₁₇ Sr ₅ , C ₆₀ K,
59	NbPt ₃ , Pt ₃ Ta, ClLiNTi, BrOTi, NbPd ₃ , C ₄ I ₈ OY ₉ , Ag ₃ Sn, Au ₃ Hf, Au ₃ Zr, Bi ₅ K ₆ Zn, AsPdZr, Ba ₇ Ga ₄ Sb ₉ , Br ₃ La ₆ Si ₇ ,
60	F ₄ NaTi, S ₅ U ₂ , O ₂ Re,
61	AgF ₂ ,
62	InPdSr, AlCaPt, PtSnY, InPtSr, As ₂ Sc ₃ , AlGe ₃ Y ₂ , AgAlCsF ₆ , AgAsF ₇ , AlMgSi, AlPd ₂ , AlAu ₂ , Cs, AlAuY, AlY ₂ , AlPt ₂ , AsMo, AlPd ₅ , AgSc ₆ Te ₂ , AgTe ₂ Y ₆ , AgSr, As ₃ Ti ₅ , FNaNbO ₂ , Ba ₃ I ₂ P ₃ , F ₅ K ₂ Ti, Bi ₃ Ca ₅ , Bi ₃ Sr ₅ , GaPd ₂ , AgBa, C ₂ MoY, PW, O ₃ TiY, P ₂ Sc ₃ , AgF ₃ K, C ₂ WY, PPd ₃ , PdSbZr, PdScSi, Pd ₂ Tl, PdSnY, PdYZn, GeNbPt, PdY ₃ , PtY, PtScSi, PtSiY, AgCaGe, Pd ₂ SiY, GePd ₂ Y, GePtSc, GePtY, Pt ₂ SiY, Ge ₂ LiSr, YZn ₃ , PtSc ₃ Si ₃ , CaGaPt, P ₃ Pd ₄ Zr ₃ , GeNb ₃ Te ₆ , CaInPd, CaInPt, CaGe ₂ Li, Ge ₄ Hf ₂ Nb ₃ , CaLiSi ₂ , Si ₄ Y ₅ , Sb ₃ Zr ₅ , CaNbO ₃ , Ge ₄ Nb ₅ , Ge ₄ Nb ₃ Zr ₂ , Ge ₄ Nb ₃ Y ₂ , Ge ₄ Nb ₃ Sc ₂ , Ge ₄ Hf ₄ Nb, Ge ₄ Sc ₅ , CaPtSb, Ge ₄ Y ₅ , Ca ₂ In, AgAuF ₇ , Pt ₄ Y ₅ , Hg ₆ K, Hf ₅ Sb ₃ , InPd ₂ , Hf ₃ P ₃ Pd ₄ , Hf ₃ PdSb ₇ , Ca ₅ Sb ₃ , SiTa ₃ Te ₆ , Sb ₃ Sr ₅ , PdSb ₇ Zr ₃ , N, N ₃ Nb ₂ , NaO ₄ Ti ₂ , NbO ₃ Sr, NbPdSi, NbPtSi, NbPdTe ₅ , Nb ₂ P ₅ , Nb ₃ Sc ₂ Si ₄ , Nb ₃ SiTe ₆ , LaSi, LuPt, LaPdZn, GeLa, AuLu ₂ , LaPtSn, LuPtSi, GeLuPt, LuPd ₂ Si, LuZn ₃ , GaPd ₂ U, GeLaPd ₂ , GeLuPd ₂ , LaO ₃ Ti, LaO ₃ Pd, GeLa ₃ , NaO ₃ U, Lu ₃ Pt, LuPt ₂ Si, Au ₂ In ₄ La, Ge ₄ Nb ₃ U ₂ , Ge ₄ Lu ₂ Nb ₃ , Ge ₄ Ta ₃ U ₂ , Ge ₄ Lu ₅ , Cl ₅ K ₂ U, Ge ₄ La ₅ , PRe ₂ , Br ₅ K ₂ U, Cl ₅ Rb ₂ U, AuLu ₆ Te ₂ , AgLu ₆ Te ₂ , Lu ₅ Pt ₄ , La ₅ Sn ₄ , La ₅ Pb ₄ , Ba ₂ O ₅ Re, La ₃ Pd ₄ Sn ₆ , La ₃ MoO ₇ , F ₈ K ₂ Re, P ₃ Ti ₅ , PtY ₃ , Sb ₃ Ti ₅ , Pb ₄ Y ₅ , Sn ₄ Y ₅ , CsTe ₆ U, Nb ₃ Si,
63	AlHf, PdScZn, Ga ₂ PdY, Ca ₃ Tl ₅ , In ₇ K ₂ Sr, AgCa, AlZr, AuCa, BMo, BW, Ag ₇ Ca ₂ , B ₃ Nb ₂ , BiZr, CBMo ₂ , CaGa, C ₂ B ₃ Nb ₄ , Cd ₃ Y, Cd ₇ Sc, GaLi ₂ , GeSc, GeY, Ga ₃ PdSr, Ge ₂ Sc, Ca ₃ Ga ₅ , Ge ₃ Y, HfSb, InLi ₂ , As ₇ Rb ₄ Zn ₇ , Li ₂ Tl, Hf ₃ Sc, NaSi ₆ , K ₃ O ₄ Pd ₂ , K ₄ P ₃ , Ge ₄ Li ₉ , Pb ₂ Y, Ca ₄ P ₅ Pd ₅ , O ₄ PTi, PdY, PtScZn, SiY, Sn ₂ Y, NbZn ₁₆ , Te ₃ Y, PtTaTe ₅ , Pd ₂ Si ₃ Y ₃ , Na ₉ Sn ₄ , Sr ₃ Tl ₅ , Ge ₆ Li ₁₁ , KMo ₅ O ₁₃ , Ca ₇ Li ₅ Sn ₁₁ , P ₅ Pd ₅ Sr ₄ , AuTh, AlTh, LuSi, LaPd, LaPt, LaSn, LuSn ₂ , Ge ₂ Lu, CBU, Ga ₂ LuPd, LaMg ₂ Pd, In ₂ LaPd, Cd ₂ LaPd, LaPdSn ₂ , BaLaSi ₂ , Cd ₃ Lu, Ge ₂ LaPd, LaZn ₄ , S ₃ ScU, LaSeTe ₂ , LuTe ₃ , Ge ₂ LaPt, LaTe ₃ , LaPtSi ₂ , I ₃ U, Ge ₄ Lu ₃ ,

Part 3 of all the predicted **Case 3**-TSMs:

63	Ga ₅ U ₃ , Th ₃ Tl ₅ , In ₅ Th ₃ , La ₃ Sn ₄ , La ₃ Sn ₅ , Ge ₃ Li ₂ Lu ₃ , Lu ₇ Te, Al ₆ Re, Ge ₇ Re ₃ , B ₇ ReY ₃ , BrO ₂ U, AuCaIn ₂ , Ga ₅ Zr ₃ , N ₅ NaTa ₃ , K ₃ O ₄ Pt ₂ ,
64	AgCs ₂ F ₄ , Bi, Au ₁₀ Ca ₄ In ₃ , Si, NaTl, BCl ₁₄ Zr ₆ , CsI ₁₄ Zr ₆ , LaSb ₂ , Al ₃ Ge ₄ La ₂ , Au ₂ Lu ₅ Te ₂ , I ₁₄ KZr ₆ ,
65	Cl ₂ Na ₃ , B ₆ Nb ₅ , B ₆ Ta ₅ , Ga ₃ Pt ₅ , Ca ₇ N ₂ Tl ₃ , P, B ₂₀ Na ₃ , C ₃ B ₆ Nb ₇ , C ₂ B ₃ Y ₂ , O ₄ UY, La ₃ Sn ₇ , Cl ₅ O ₂ U ₂ , Ge ₁₀ La ₇ Li ₈ , Cs ₂ KO ₁₄ Si ₄ U ₂ , C ₇ Re ₂ Sc ₅ ,
67	Ba ₂ NaO,
69	NPd,
70	Au ₄ KS ₆ , BPd ₆ , C ₈ K, C ₈ Rb, Nb ₃ O ₁₀ U,
71	Y ₃ Zn ₁₁ , AgCa ₂ Pd ₂ , AlSi ₂ Y ₂ , Au ₃ Rb ₂ , Br, Ba ₃ Hg ₁₀ In, NbPd ₂ , NbPt ₂ , Hg ₁₁ K ₃ , Pd ₂ Ta, Br ₆ NaO ₂ W ₂ , In ₁₁ Sr ₃ , AlLu ₂ Si ₂ , KSe ₆ U ₂ , KSe ₆ Th ₂ , La ₃ Pd ₄ Zn ₄ , Ge ₅ La, La ₃ Pd ₄ Si ₄ , Ge ₄ La ₃ Pd ₄ , Se ₆ TlU ₂ , Ge ₄ La ₃ Li ₄ , RbSe ₆ Th ₂ , Ge ₁₆ La ₁₁ Li ₁₂ , ReSi ₂ , La ₃ Pt ₄ Zn ₄ , Au ₃ K ₂ , B ₄ Nb ₃ , B ₄ Ta ₃ , Ba ₂ Bi ₃ , C ₄ B ₄ Nb ₇ ,
74	Au ₅ InK ₃ , ClNa ₂ , Ga ₂ Sc, Hg ₂ K, Hg ₂ Rb, CsHg ₂ , P, Si ₂ Y, In ₂ La, LaZn ₂ , LuZn ₂ , Ga ₂ Lu, LaSi ₂ , Au ₂ La, Ag ₂ La, Ge ₂ La, La ₃ Pd ₅ Si, Au ₅ K ₃ Tl, Ge ₂ NaPd ₃ , GaMgMo ₄ O ₇ ,
75	CNSTl, NbTe ₄ ,
79	Sb ₂ TlZn ₂ , Al ₂ Si ₃ U ₃ ,
83	C ₄ UW ₄ ,
85	Hf ₅ Sb ₉ , AgBF ₅ , Se ₃ Tl ₅ ,
86	Nb ₃ P, GeHf ₃ , Hf ₃ P, AsNb ₃ , AsTi ₃ , GeZr ₃ , PTi ₃ , SiZr ₃ , SiTi ₃ , AsTa ₃ , PTa ₃ , GeLa ₃ ,
87	Au ₄ Sc, Hg ₁₉ Rb ₅ , Ag ₄ Sc, N ₅ Nb ₄ , Nb ₅ Se ₄ , Nb ₅ Te ₄ , Nb ₅ Sb ₄ , As ₄ Ta ₅ , Sb ₄ Ta ₅ , As ₄ Nb ₅ Pd ₄ , Nb ₅ P ₄ Pd ₄ , Ba ₉ In ₄ , Pt ₁₁ Zr ₉ , Pt ₁₂ Si ₅ , In ₄ Pd ₁₇ Se ₄ , S ₈ Zr ₂₁ , Nb ₂₁ S ₈ , Cs ₅ Hg ₁₉ , Cs ₃ Te ₂₂ , Au ₄ Lu, F ₅ U, O ₆ ReSr ₂ Zn, Ba ₂ CaO ₆ Re,
88	CsFO ₃ S, GaMg, O ₄ Pd ₂ Y, Ge ₈ Pd ₂₁ , Al ₂₁ Pd ₈ , Al ₁₇ Pd ₈ Si ₄ , Al ₂₁ Pt ₈ , LaO ₄ Pd ₂ ,
92	MgO ₄ Ti ₂ , Si ₄ Ti ₅ , Hf ₂ Sc ₃ Si ₄ , Pr ₅ Si ₄ , Re ₃ Sc ₂ Si ₄ ,
95	LiNbO ₄ Zn,
97	ISe ₈ Ta ₂ ,
102	U,
103	TaTe ₄ , NbTe ₄ , NbSe ₄ ,
104	Ba ₅ Bi ₅ In ₄ ,
107	GeP, PSn, LiPdSi ₃ , In ₂ Te ₃ , AsGe, AuSi ₃ Sr, AuBaSn ₃ , BaGe ₃ Pd, Al ₃ AuLa,

Part 4 of all the predicted **Case 3**-TSMs:

108	Bi ₂ O ₄ Pd, Ca ₅ Ge ₃ , K ₂ Se ₄ Sn ₂ ,
109	AsCaPt, LiMo ₈ O ₁₀ , GeLaPt,
110	As ₂ Cd ₃ ,
113	NaSn ₅ , Ta ₂₂ , Ta ₃₀ , Ta,
115	CB ₂ N, PdSb ₃ Zr ₂ , C ₇ B, Hf ₂ PdSb ₃ ,
120	Au ₄ KSn ₂ ,
121	Au ₁₂ K ₂₃ Sn ₉ ,
123	AgTi, PtZn, CdPt ₂ Zn, AsHgPd ₅ , AsGaPd ₅ , GaPPd ₅ , AsPt ₅ Zn, CdPPt ₅ , BaBi ₂ OTi ₂ , In ₂ Pd ₈ Se, BaNb ₄ O ₆ , BaNb ₇ O ₉ , AlTi, AlPt ₃ , AgZr ₃ , AgHg ₂ Ti, AsCdPd ₅ , CaPb, CdPd, CdPt, InMg, Au ₃ Cd, PdTi, SnTi, HgPd, GaTi, HgPt, SiSr, Cd ₃ Zr, Hg ₂ Pt, Pd ₃ Tl, InPd ₃ , BaBi ₃ , As ₂ BaPd ₂ , Sr, BaP ₂ Pd ₂ , InPt ₃ , AsInPd ₅ , AuCl ₃ Cs, AsPd ₅ Tl, AlPPt ₅ , HgPd ₅ Se, CdPd ₅ Se, MgPPd ₅ , InPd ₅ Se, CdPPd ₅ , Pd ₅ SeTl, Pd ₅ SeZn, HgPPd ₅ , InPPd ₅ , AsMgPt ₅ , CGaPt ₃ , AsCdPt ₅ , PPd ₅ Zn, AgPPt ₅ , PPd ₅ Tl, PPd ₅ Sn, AsPt ₅ Tl, AgPt ₅ Si, Pt ₅ SbSi, MgPPt ₅ , PPt ₅ Zn, InPPt ₅ , PbPt ₅ Si, Pt ₅ SiTl, FKNb ₄ O ₅ , InPt ₅ Si, PPt ₅ Tl, PPt ₅ Sn, AsIn ₂ Pt ₈ , Nb ₅ O ₉ Sr ₂ , KO ₅ S ₂ Ti ₂ Y ₂ , Ba ₂ Nb ₅ O ₉ , Nb ₄ O ₆ Sr, AsLa, AgLa, CdLa, LaSb, Ga ₅ PdU, Ga ₆ LaPd, Ga ₅ PtU, C ₂ Re,
124	NbTe ₄ , TaTe ₄ ,
125	Ga ₆ Y, Ag ₅ RbSe ₃ , Ga ₆ La,
126	Cd ₃₂ K ₆ ,
127	Hg ₅ Pd ₂ , Hf ₂ In ₅ , Be ₂ Nb ₃ , AlSc ₂ Si ₂ , Au ₂ Ca ₂ Pb, PbPd ₂ Y ₂ , InPd ₂ Y ₂ , LiSi ₂ Y ₂ , B ₂ Nb ₃ , B ₂ Mo ₃ , Ga ₂ Nb ₃ , Ga ₂ MgSc ₂ , Ca ₃ Hg ₂ , Be ₂ Ta ₃ , B ₂ Mo ₂ Nb, Au ₂ InY ₂ , B ₂ Mo ₂ Ta, B ₂ Ta ₃ , C ₂ B ₂ Y, In ₅ Ti ₂ , Ga ₅ W ₂ , Hg ₂ Sr ₃ , Ge ₂ Hf ₃ , Ga ₂ Ta ₃ , Mo ₃ Si ₂ , Nb ₃ Si ₂ , Si ₂ W ₃ , LiPd ₂ Sn ₆ , KMo ₄ O ₆ , Mo ₄ NaO ₆ , Mo ₄ O ₆ Sn, B ₄ W, InPd ₂ Th ₂ , C ₂ B ₂ La, B ₄ Th, InLa ₂ Pd ₂ , InPd ₂ U ₂ , Ge ₂ InLa ₂ , InLu ₂ Pd ₂ , C ₂ B ₂ Lu, Ge ₂ Lu ₂ Mg, La ₂ PbPd ₂ , InPt ₂ U ₂ , La ₃ Si ₂ , N ₂ Re, O ₃ Re, B ₂ ReTi ₂ , ClF ₆ K ₃ Re, Pd ₂ SnU ₂ , Lu ₂ PbPd ₂ , Pt ₂ SnU ₂ , Ba ₃ O ₁₅ Ta ₅ , Al ₂ Th ₃ , Ga ₂ Th ₃ , Ge ₂ Th ₃ ,
128	Cl ₆ K ₂ Nb, F ₁₄ K ₅ Ti ₃ , Re ₃ Si ₅ Y ₂ , Pd ₄ Rb ₂ Se ₁₇ U ₆ ,
129	AuHf, BBe ₄ , PSnSr, AuTi, AgZr, AsNbSi, AgTi, SiTiY, PdTa, BiIn, AgHf, S ₂ Y, GeTiY, AsSiTa, GeTeZr, SbSc ₂ , MoNTa, GeSbTi, GeSbZr, AgMgSb, NbSbSi, BaMgSi, Te ₂ Y, BiKMg, Sn ₂ YZn, Au ₂ BaSn ₂ , As ₂ Pt ₂ Sr, Au ₃ BaGe, Au ₃ GeSr, Pt ₂ Si ₂ Y, Au ₃ BaSi, Bi ₉ Ti ₈ , AsSeTh, Al ₂ Au ₂ U, GeLaTi, AsSU, BiSbU, AsSbU, BiTeTh, BiTeU, LaS ₂ , AsSeU, As ₂ Pa, LuS ₂ , Al ₂ LaPd ₂ , LaPdSb ₂ , Ga ₂ LaPd ₂ , LaTe ₂ , AsTeTh, P ₂ Pa, Al ₂ Au ₂ La, NTeU, PaSb ₂ , BiLa ₂ N, SbTeTh, PSeU, PSeTh, GeLuTi, Bi ₂ Th, As ₂ Th, PSU, PSTh, LuSe ₂ , Bi ₂ U, SSbU, AuSb ₂ U,

Part 5 of all the predicted **Case 3**-TSMs:

129	LuTe ₂ , SbSeU, LuSiTi, LaPd ₂ Sb ₂ , LaSe ₂ , SbSeTh, Sb ₂ Th, AuBi ₂ La, LuSn ₂ Zn, Te ₂ U, SbTeU, Au ₂ Si ₂ U, Ge ₂ LaPt ₂ , Pt ₂ Si ₂ U, LaPt ₂ Si ₂ , AsSTh, AsTeU,
130	AlMg ₄ Si ₃ , Se ₃ Tl ₅ , AuBi ₂ O ₅ , Ge ₃ La ₅ ,
131	OPd, NPd, C ₂ B ₂ Lu, C ₂ B ₂ La,
132	O ₂ Si, Bi ₂ O ₃ ,
134	B, Ag ₂ Li ₃ Si ₃ , Ag ₂ Ge ₃ Li ₃ , B,
135	CB ₂ Y,
136	InPd ₂ Sc ₂ , BiPb ₃ Pt, Ta, O ₂ Pd, NbO ₂ , NTi ₂ , O ₂ Pt, Au ₂ InSc ₂ , Au ₂ Sc ₂ Sn, Au ₂ InZr ₂ , InPd ₂ Zr ₂ , F ₆ Na ₂ Nb, Au ₂ Hf ₂ In, Hf ₂ InPd ₂ , Au ₂ SnY ₂ , Au ₂ SnY ₂ , AuTa ₂ , Al ₂ Pt ₄ Ti ₉ , AlTa ₂ , Ca ₁₁ N ₈ , Ga ₆ Na ₁₀ Sn ₃ , InPt ₂ U ₂ , Au ₂ Lu ₂ Sn, Au ₂ InLu ₂ , Pt ₂ SnU ₂ , U, O ₂ Re, Re ₄ Si ₂ Y, AlNb ₂ , Bi ₂ MgO ₆ , O ₂ Pb,
137	Bi ₂ Se ₃ , Cd ₃ P ₂ , TeTl, As ₂ Cd ₃ , B ₄ Re ₄ Y, Nb ₄ O ₅ ,
139	AlAu ₂ , Au ₂ Ti, AuZr ₂ , MoSi ₂ , GeSb, Ge ₂ W, Al ₄ Ca, BaGa ₄ , Al ₄ Sr, Ga ₄ Sr, Be ₁₂ Ti, B ₁₂ Sc, AlI ₂ Pd ₅ , AgCs ₂ F ₄ , Na ₂ OSb ₂ Ti ₂ , CaGe ₃ , AuORb, Cl ₁₀ K ₄ OW ₂ , Ag ₂ Sc, Ag ₂ Y, AgHf ₂ , Al ₂ BaSi ₂ , Ag ₂ Si ₂ Sr, Ag ₂ Sn ₂ Sr, Ag ₂ Ge ₂ Sr, Al ₂ Pb ₂ Sr, Al ₃ Nb, Al ₃ Ti, Al ₃ Ta, AgBe ₁₂ , Br, In ₄ Sr, AuHf ₂ , Au ₂ Nb ₃ , CdTi ₂ , Al ₄ Ba, Bi, Au ₂ Sc, Ga ₃ Ta, Au ₂ Y, CaGa ₄ , Ga, Ga ₃ Nb, Sc, Tl, P ₂ Pd ₂ Y, Be ₁₂ Pd, OPd, AuBe ₁₂ , Au ₂ Si ₂ Y, BaIn ₄ , Ga ₄ Na, Cl ₂ O ₄ Pb ₄ , Al ₃ Zr, In, AgTi ₂ , BiO ₂ Y ₂ , Hf ₂ Tl, Sb, Ga ₃ Ti, I, NbPd ₃ , S ₂ Ti, NbS ₂ , C ₂ Y, Pd ₃ Tl, Be ₁₂ Ta, Au ₄ CaCd ₂ , Ge ₂ Mo, Si ₂ W, Pd ₂ Si ₂ Y, Ga ₃ Hf, Pd ₃ Ta, Al ₂ Pd ₅ Y, Ge ₂ Pd ₂ Sr, Be ₁₂ Pt, N ₃ Nb ₄ , Pt ₂ Si, Rb, Pt ₂ Si ₂ Y, F ₄ Nb, Be ₁₂ Nb, C ₂ BSc ₂ , GeTiY, Ga ₄ Ti ₂ Y, KO ₂ , In ₄ K, C ₂ Bi ₂ CaO ₈ , N ₂ Sr, As ₂ BaPd ₂ , Pt ₃ Sb, Ag ₂ CaGe ₂ , YZn ₁₂ , ScZn ₁₂ , Ga ₅ Mg ₂ , Cl ₆ NbRb ₂ , Ge ₃ Sr, BaBi ₄ Cl ₂ O ₆ , Ca ₂ Na ₂ O ₁₀ Ta ₃ , Ge ₄ In ₆ Y ₁₁ , Ge ₁₀ Sc ₁₁ , Sn ₁₀ Y ₁₁ , In ₆ Si ₄ Y ₁₁ , Ca ₁₁ Sb ₁₀ , Sb ₁₀ Sr ₁₁ , Ag ₂ Lu, Al ₂ LaZn ₂ , Au ₂ Lu, Au ₂ Si ₂ Th, Au ₂ Ge ₂ Th, BiLa ₂ , Al ₄ La, BiN ₂ U ₂ , Al ₂ Ga ₂ La, As ₂ LaPd ₂ , Au ₂ LaSi ₂ , Ag ₂ LaSi ₂ , C ₂ Lu, Ge ₂ Pd ₂ U, BiLa ₂ O ₂ , C ₂ Pa, La, AsTeU, I ₂ La, Pa, Li ₃ O ₄ U, Ge ₂ LaPd ₂ , LaP ₂ Pd ₂ , MoU ₂ , BiN ₂ Th ₂ , Ge ₂ LaPt ₂ , LuPb ₂ , LaPd ₂ Si ₂ , Ga ₄ LuTi ₂ , LuPd ₂ Si ₂ , GeTeTh, Pd ₂ Si ₂ U, GeSeTh, LuPt ₂ Si ₂ , N ₂ SbU ₂ , N ₂ TeU ₂ , CB ₂ Pt ₂ Th, N ₂ SbTh ₂ , SiTeTh, La ₃ N ₆ Ta ₂ , O ₄ Sr ₂ U, LaMg ₁₂ , LuO ₄ S ₅ U ₄ , LuZn ₁₂ , LaLi ₂ O ₇ Ta ₂ , LuSi ₃ , La ₃ N ₆ Nb ₂ , Ge ₁₀ Lu ₁₁ , AlRe ₂ , C ₂ Re, ReSi ₂ , Cl ₁₀ Cs ₃ ORe ₂ , ZnZr ₂ ,
140	Pb ₂ Pd, AuPb ₂ , AlHf ₂ , Ga ₂ SnTa ₅ , GaNb ₅ Sn ₂ , Mo ₅ Si ₃ , Nb ₂₀ Si ₁₂ , Si ₃ Ta ₅ , In ₃ Sr ₅ , FPb ₃ Sr ₅ , AlZr ₂ , BMo ₂ , Sr, AgIn ₂ , AuNa ₂ , SZr ₂ , Ba, BTi ₂ , GaHf ₂ , GeHf ₂ , PdTl ₂ , AuTl ₂ , BW ₂ , GaZr ₂ , BTA ₂ , GaPt ₃ , AgF ₃ Rb, Ga ₅ Pd, AgCsF ₃ , Al ₃ Zr ₅ , Au ₄ In ₂ Rb, Au ₄ In ₂ K, Nb ₅ Si ₃ , Ge ₃ Nb ₅ , BGe ₂ Nb ₅ , Ge ₃ Mo ₅ , Ga ₃ Nb ₅ , Ga ₃ NbZr ₄ , Nb ₅ SiSn ₂ , Ga ₃ Ti ₅ , Au ₃ Cd ₅ , Ge ₃ W ₅ , Au ₃ Ca ₅ , Ge ₃ Ta ₅ , W ₅ Zr ₃ , Bi ₃ In ₄ Pb, AuSe ₃ Tl ₄ , Ca ₅ Ga ₃ , Ag ₃ Ca ₅ , Ca ₅ Ge ₃ , Ca ₅ Si ₃ , Ca ₅ Zn ₃ , Ca ₅ Pt ₃ , Pb ₃ Sr ₅ , B ₂ GeTa ₅ ,

Part 6 of all the predicted **Case 3**-TSMs:

140	Te ₃ Tl ₅ , TeTl, Si ₃ W ₅ , Sr ₅ Tl ₃ , Ba ₅ Pb ₃ , Ba ₁₁ In ₆ O ₃ , GeTh ₂ , InTh ₂ , AuTh ₂ , AlTh ₂ , PdTh ₂ , Th ₂ Zn, GaTh ₂ , AgTh ₂ , HgTh ₂ , Th ₂ Tl, ClGa ₄ La ₃ , Ge ₂ La ₅ Si, S ₅ U ₃ , La ₅ Si ₃ , Lu ₅ Pd ₂ Sb, Ga ₃ La ₅ , La ₅ SnZn ₂ , La ₅ Sn ₃ , AuF ₁₁ U ₂ , Cl ₄ Ga ₅ La ₁₀ , Br ₄ Ga ₅ La ₁₀ , Al ₅ Br ₄ La ₁₀ , Re ₅ Si ₃ , Al ₄ Br ₄ La ₅ , La ₅ Tl ₃ , BeTa ₂ , Cs ₉ InO ₄ ,
141	K, Cs, Mo ₂ N, Ge ₂ Y, LiSn, In ₂ NSr ₄ , AuLi ₂ Sn ₂ , Ca ₄ In ₂ N, O ₅ Ta ₂ , CCl ₁₃ Cs ₄ Sc ₆ , Rb, Sr, Si ₂ Y, LiO ₂ Ti, NTi ₂ , GeLi, AgLi ₂ Sn ₂ , LaSi ₂ , PbTh, LiN ₂ U, Cl ₄ U, Ge ₂ La, LaMgSi ₂ , Cl ₄ Pa, Br ₄ Pa, O ₄ SiU, LaZn ₁₁ , La ₃ Zn ₂₂ , B ₄ Re ₄ , Ag ₆ GeO ₈ S,
142	Pd ₁₆ Sn ₃₂ , PdSn ₂ ,
143	BiTe, AlCaSi,
146	CBr ₁₂ Sc ₇ , Au ₅ Sn, P ₃ Pd ₇ , Cl ₁₂ Sc ₇ , Cl ₆ LiW,
147	Cl ₁₈ Cs ₂ W ₆ , NW ₂ , Au ₁₀ In ₃ , Br ₂ Hg ₃ Se ₃ Zn,
148	F ₆ PdPt, CsMo ₆ Se ₇ , Cl ₁₂ Zr ₆ , BCl ₁₂ Sc ₇ , Cl ₃ Ti, F ₆ PdZr, F ₆ LiPt, Br ₃ Ti, AgBiO ₃ , Pd ₄ Zr ₃ , Au ₄ Ca ₃ , Mo ₆ Te ₈ , Mo ₆ Se ₈ Y, HgMo ₆ S ₈ , CaMo ₆ S ₈ , Ca ₃ Pd ₂ , AgMo ₆ Se ₈ , Mo ₆ S ₈ Y, BiMo ₆ S ₈ , InMo ₆ Se ₈ , BaMo ₆ S ₈ , AgMo ₆ S ₈ , KO ₃ Sb, Mo ₆ NbS ₈ , Mo ₆ PbS ₈ , InMo ₆ S ₈ , Mo ₆ S ₈ Sr, Mo ₆ S ₈ Sn, Ca ₃ Pt ₂ , LiMo ₆ Se ₈ , Mo ₆ S ₈ Sb, Cl ₁₂ Sc ₇ , Mo ₆ Se ₈ Tl, Mo ₆ Se ₈ Sn, Mo ₆ PbSe ₈ , Mo ₆ S ₈ Tl, Pt ₂ Sr ₃ , Ag ₂ Sr ₃ , Au ₂ Ba ₃ , AlPd, Br ₁₂ Zr ₆ , Pd ₄ Y ₃ , Pd ₂ Y ₃ , I ₁₂ Zr ₆ , P ₂ Pd ₁₅ , Pd ₂₀ Sb ₇ , Pd ₂₀ Te ₇ , NaO ₁₃ Ti ₈ , Cl ₁₈ W ₆ , Mo ₁₂ Rb ₂ Se ₁₄ , Cl ₁₈ K ₂ Zr ₇ , Bi ₁₂ Zr ₆ , Cs ₂ Mo ₁₂ Se ₁₄ , Mo ₁₈ Rb ₄ Se ₂₀ , CsF ₆ U, I ₆ Na ₂ U, Lu ₃ Pd ₄ , LuMo ₆ S ₈ , La ₃ Pd ₄ , Mo ₆ S ₈ U, LuMo ₆ Se ₈ , Pd ₄ Th ₃ , LaMo ₆ S ₈ , Lu ₃ Pt ₄ , La ₃ Pt ₄ , La ₃ Pt ₂ , LaMo ₆ Se ₈ , Cl ₁₈ LuNb ₆ , CCl ₁₈ Cs ₂ Lu ₇ , Ga ₄₀ LaMo ₈ , Cl ₆ Re, Ag ₂ Cl ₆ Re, CsF ₆ Re, O ₁₂ ReSc ₆ , Ba ₆ N ₆ ORe ₂ , P ₁₃ Re ₆ , P ₂₆ Re ₁₂ , Cl ₁₂ ReTe ₂ , Br ₂ Mo ₆ S ₆ , Ag ₂ Ba ₃ , Au ₂ Sr ₃ , Cs ₂ Mo ₁₂ Te ₁₄ , I ₆ MoO ₁₈ Rb ₂ ,
149	Cl ₃ Ti,
150	F ₃ Pd,
152	Te,
154	HgSe,
155	OZr ₃ , Li ₄ Pt ₃ Si, HgMg ₃ , Ag ₃ BO ₃ ,
156	CB ₂ N, C ₇ B, CdS ₂ Tl, CaLiSn, Cl ₆ K ₂ NaU,
157	Ag ₅ O ₆ Pb ₂ , AuCd, Al ₄₀ Ba ₂₁ , CsNO ₃ ,
158	Cl ₁₅ HgS ₃ Se ₃ Zn,
159	C ₅ Al ₃ Zr ₂ , C ₅ Al ₃ Hf ₂ ,
160	AsSe ₂ , AgTe ₃ , BiO, CB ₂ N, As ₃ Sn ₄ , HgS ₂ Ta, B ₄ Li ₅ , Br ₂ Ca ₃ Si, KS ₂ Sn, NbSe ₂ , KS ₂ Ti, In ₂ S ₄ Zn, AlMo ₄ S ₈ , C ₃ Al ₈ N ₄ , GaMo ₄ S ₈ , GaMo ₄ Se ₈ , C ₇ B, Cs ₂ O ₁₂ U ₄ ,
161	Ge ₃ Li ₈ Zn ₂ , Ge ₁₃ Pt ₄ Y ₃ , LiO ₃ U, LiO ₃ Re, Li ₂ O ₃ Re,

Part 7 of all the predicted **Case 3**-TSMs:

162	F ₆ Li ₂ Nb, NNb ₂ , As ₂ O ₆ Pd, NTa ₂ , F ₆ Hg ₃ Nb, CW ₂ , Ag ₅ O ₆ Pb ₂ , MoN, AgSe ₂ Tl,
163	OTi ₃ , Cl ₃ Ti, In ₂ Pt ₃ , F ₆ GaLiPd, AlF ₆ LiPd, Cl ₆ MoNa ₃ , KMo ₁₂ S ₁₄ , Cl ₁₈ CsPbTa ₆ ,
164	NbS ₂ , O ₂ PZr ₃ , CdInS ₂ , Ag ₂ F, Cl ₂ Ti, AuTe ₂ , AlCl ₃ , CaHg ₂ , CSc ₂ , Cd ₂ Y, CdSe ₂ Tl, CdTe ₂ Tl, Cl ₂ NSc ₂ , Au ₃ In ₂ , Al ₂ Ge ₂ Y, CdS ₂ Tl, CaSb ₂ Zn ₂ , Al ₃ Pd ₂ , Al ₃ Pt ₂ , Al ₂ Si ₂ Y, Cs ₂ F ₆ Nb, Al ₁₃ Ba ₇ , Cs ₂ F ₆ NaTi, N ₂ Zr, HfTe ₂ , LiS ₂ Ti, NbSe ₂ , LiS ₂ Sn, NbTe ₂ , OTi ₂ , LiSe ₂ Zr, LiTe ₂ Ti, Ga ₃ Pt ₂ , In ₃ Pd ₂ , In ₃ Pt ₂ , Se ₂ Ti, S ₂ Ta, Se ₂ Ta, O ₂ PTi ₃ , Sb ₂ SrZn ₂ , In ₄ Li ₅ , F ₆ NbRb ₂ , Hg ₇ K ₂ , Hg ₇ Rb ₂ , Li ₁₃ Sn ₅ , MoN, Pd ₁₃ Tl ₉ , Mo ₆ O ₁₇ Tl, Ge ₇ Nb ₁₀ , Au ₂ U, Cd ₂ Lu, Al ₂ Ge ₂ La, Al ₂ Ge ₂ Lu, Cd ₂ La, AsN ₂ U ₂ , Br ₂ La ₂ P, N ₂ PU ₂ , Hg ₂ La, N ₂ SeU ₂ , N ₃ Th ₂ , N ₃ U ₂ , I ₂ La ₂ P, ReTi ₂ , F ₆ K ₂ Re, CdGaInS ₄ ,
165	Ba, AsLi ₃ , AuMg ₃ , La ₅ O ₁₅ Ti ₄ , F ₃₀ GaNa ₃ U ₆ ,
166	HgIn, Se ₂ Ta, PTe ₂ Ti ₂ , Au ₇ Cs ₄ Sn ₂ , Al ₂ Li ₃ , Ba ₂ N, LiPb, AgInSe ₂ , B ₃ Mo, HgNa ₃ , Li, Ga ₂ Li ₃ , LiMoO ₂ , In ₂ Li ₃ , F ₃ Ti, LiS ₂ Sn, Ge ₂ Li ₄ Zr, In ₂ Se ₃ , Se, Ca ₂ N, Po, Te, GeTe, S, NbS ₂ , GeP ₃ , MoNaO ₂ , NSr ₂ , LiS ₂ Ti, As ₂ NaSn ₂ , In ₃ Te ₄ , KS ₂ Ti, Na, Cd ₄ KP ₃ , NaS ₂ Ti, B ₅ Mo ₂ , KS ₂ Sn, KS ₂ Zr, NaS ₂ Sn, RbS ₂ Sn, Li ₅ Tl ₂ , Li ₅ Sn ₂ , Y ₂ Zn ₁₇ , B ₅ W ₂ , Na ₅ Pb ₂ , PTe ₂ Zr ₂ , Be ₃ Ti, Be ₃ Nb, As ₃ Sn ₄ , Na ₅ Sn ₂ , As ₃ NaZn ₄ , Be ₃ Ta, P ₃ Sn ₄ , Pb ₂ Pd ₃ Se ₂ , Pd ₃ Se ₂ Tl ₂ , Bi ₃ Se ₄ , P ₃ Sn, Pb ₂ Pd ₃ S ₂ , Be ₁₇ Nb ₂ , Ga ₇ Rb, Be ₁₇ Zr ₂ , Be ₁₇ Ti ₂ , Bi ₄ Te ₃ , Al ₃ Y, CsGa ₇ , Be ₁₇ Ta ₂ , Be ₁₇ Hf ₂ , Sn ₃ Sr, SbSn, Ag ₂ Al ₇ Ca ₃ , B ₁₃ N ₂ , C ₂ B ₁₂ Be, C ₂ B ₁₃ , C ₃ Al ₈ N ₄ , Al ₉ Sr ₅ , BaPb ₃ , Au ₇ Rb ₄ Sn ₂ , Au ₇ Ge ₂ K ₄ , Li ₅ Na ₂ Sn ₄ , Cs ₄ OTl ₂ , CClLa ₂ , Lu, NU, LiO ₃ U, Ge ₃ La, Th ₂ Zn ₁₇ , PU, CB ₂ U, La ₂ Zn ₁₇ , Lu ₂ Zn ₁₇ , U ₂ Zn ₁₇ , O ₆ PbRe ₂ , Ag ₄ Sb ₂ Sr,
167	Au ₆ Sr ₂ Zn ₃ , HgO ₃ Sn, NPd ₃ , F ₃ Ti, F ₃ Pd, F ₃ Mo, Al ₅ Mo, OZr ₃ , O ₃ Ti ₂ , BO ₃ Ti, Au ₆ Ga ₃ Sr ₂ , Cd ₆ Sb ₅ , Ga ₅ NSr ₆ , Hg ₃ Na ₈ , Al ₃ Au ₈ , Ba ₆ Ga ₅ N, Mo ₉ S ₁₁ Tl ₂ , Ba ₆ In ₅ N, K ₈ Tl ₁₁ , K ₂ Mo ₉ S ₁₁ , Mo ₉ Rb ₂ S ₁₁ , In ₁₁ K ₈ , Rb ₈ Tl ₁₁ , In ₁₁ Rb ₈ , Mo ₁₅ Na ₂ Se ₁₉ , Cs ₈ Ga ₁₁ , Ba ₁₄ CaN ₆ Na ₇ , Ba ₂ Mo ₁₅ Se ₁₉ , Mg ₂₁ Zn ₂₅ , Mo ₁₅ Pb ₂ Se ₁₉ , Mo ₁₅ Rb ₂ S ₁₉ , Mo ₁₅ Se ₁₉ Sn ₂ , Li ₂ Mo ₁₅ Se ₁₉ , K ₂ Mo ₁₅ Se ₁₉ , In ₂ Mo ₁₅ Se ₁₉ , K ₂ Mo ₁₅ S ₁₉ , Cs ₂ Mo ₁₅ S ₁₉ , Mo ₂₁ Rb ₄ S ₂₅ , Ca ₆ Hf ₁₉ O ₄₄ ,
173	Al ₅ Mo, Al ₅ W, AlCaSi, CaO ₁₁ Ta ₄ , Cl ₃ KTi, I ₃ KTi, BeGaLa ₃ S ₇ , AlLa ₃ S ₇ Ti, BeInLa ₃ S ₇ , BeLa ₃ LuS ₇ ,
174	Al ₃ Zr ₄ , NTa, As ₇ Nb ₉ Pd, Te ₁₂ U ₇ , O ₂ Se ₁₂ U ₇ , B ₃ BrLa ₂ ,
176	Mo ₁₅ S ₁₉ Sn ₂ , NbSe ₂ , BaMo ₃ Te ₃ , CsMo ₃ Te ₃ , CsMo ₃ S ₃ , KMo ₃ Se ₃ , Mo ₃ RbS ₃ , Mo ₃ NaTe ₃ , Mo ₃ RbSe ₃ , LiMo ₃ Se ₃ , Nb ₃ S ₄ , BaMo ₃ Se ₃ , AsNb ₃ Te ₃ , InMo ₃ Te ₃ , KMo ₃ Te ₃ , Mo ₃ RbTe ₃ , Nb ₃ Te ₄ , Nb ₃ Se ₄ , AgMo ₃ Se ₃ , InMo ₃ Se ₃ , CsMo ₃ Se ₃ , Mo ₆ Se ₆ Tl ₂ , Mo ₃ NaSe ₃ , KMo ₃ S ₃ , Se ₄ Ti ₃ , Mo ₃ Se ₃ Tl, Au ₁₀ In ₃ , AgNb ₃ Te ₄ , Au ₁₀ Ga ₁₆ Na ₅ , AgCd ₃ F ₂₀ Hf ₃ , AgCd ₃ F ₂₀ Zr ₃ , K ₃ Mg ₁₈ Sn ₁₁ , Mo ₁₅ Se ₁₉ , K ₃ Mg ₁₈ Pb ₁₁ , Mo ₁₅ Rb ₃ Se ₁₇ , Mo ₁₅ Pb ₂ Se ₁₉ , Li ₅ Mo ₁₅ S ₁₉ , Cs ₃ Mo ₁₅ Se ₁₇ , Cs ₃ Mo ₁₅ Te ₁₇ , CCl ₁₈ LiW ₆ , CCl ₁₈ NaW ₆ , Mo ₂₇ Rb ₅ Se ₃₁ , Cl ₃ U, Br ₃ U,
180	Si ₂ Ta, MoSn ₂ , BLuPt ₂ ,
181	Si ₂ Ta,

Part 8 of all the predicted **Case 3**-TSMs:

182	Nb ₃ S ₆ Ti, IO ₆ PbRb, CsI ₁₁ Nb ₆ ,
185	Mg ₃ Pd, AuCd ₃ , Mg ₃ Pt, F ₃ U,
186	InSb, NZr, Ge, NPd, GaSb, AuScSn, AgSnY, CaSnZn, AuSnY, AuGeY, CaHgSn, AgBiCa, CSc, HgSnSr, HgPbSr, C ₄ Al ₃ Zr ₂ , Au ₃ LiSn ₄ , C ₅ Al ₃ Zr ₃ , Mo ₃ O ₈ ScZn, Au ₃ Sr ₇ , Ag ₃ Sr ₇ , LiSbSn, LiSnY, InLi ₂ Mo ₃ O ₈ , Ca ₅ Pb ₃ , AgLaPb, AuSnU, AuGeLa, AuLuSn, AgLuSn, AuGeLu, AuLaSn, C ₃ Al ₃ U, C ₄ Al ₃ U ₂ , La ₇ Pd ₃ , Pt ₃ Th ₇ , La ₇ Pt ₃ , LiLuSn, Cd ₄ La ₂₃ Pt ₇ , B ₃ Re ₇ , B ₃ Re ₇ ,
187	CAu, CdN, PbSe ₂ Ta, NTA, Se ₂ Ta, AgN, AlSn, AlGeSr, AlCaSi, AlBaSi, AsBaPd, CW, AlSiSr, AlBaGe, CMo, BaLiSi, CTA, CPt, LiPd, NNb, MoP, NPd, NZr, NW, NbS, STi, TeZr, STA, InS ₂ Ta, N ₂ Pt, PtSbSr, InSe ₂ Ta, N ₂ Ta, Al ₅ Ba ₅ Pb, Ba ₅ Ga ₅ Pb, CsO ₂ Y, GeLiZn, CaLiPb, Al ₅ Ba ₅ Sn, Au ₄ In ₆ K, Au ₄ In ₆ Rb, Ba ₅ Ga ₅ Sn, CLiNaO ₃ , CLa, AuSiTh, AuSiU, Mo ₁₃ P ₉ U, NRe, N ₂ Re, NRe ₃ , ReSe ₂ , U ₂ Zn ₁₇ ,
188	I ₃ LiSc, LaNO ₂ Si,
189	GePt ₂ , Ag ₂ Ga, InMg ₂ , InPtY, AsPd ₂ , Mg ₂ Tl, NTA, Li ₂ Sb, PdYZn, BGe ₂ Ti ₆ , Hf ₅ Sc, PdScSn, AlPdY, GePdSc, GePd ₂ , GaPtZr, Al ₂ Hf ₆ Pt, AuInY, AlPtZr, HfMoP, AlHfPt, Pt ₂ Si, MgPdY, BSi ₂ Ti ₆ , InPdY, InPtSc, SiY, MoPZr, MgYZn, PdTIY, Pd ₂ Si, PtSnY, PbPdY, PtSb ₂ Zr ₆ , PtScSn, Au ₇ Ga ₂ , In ₄ Pt ₃ Sr ₂ , Cd ₉ K ₁₄ Tl ₂₁ , Cs ₁₅ Tl ₂₇ , PTi ₂ , HgLaPd, InPtU, InLaPd, InPtTh, InPdU, InLuPd, InPdTh, LuPdZn, LaPtSn, GaPdU, InLuPt, AlPdTh, LuPdSn, AuInLu, S ₂ U, CdLaPd, AlAuLu, AlLuPd, AgLuPb, AuInLa, LaPdSn, GaPtTh, GaPtU, LaPdTi, AlPtU, LaPbPd, LaMgPd, LuPtSn, Lu ₈ Te, Al ₁₃ La ₁₆ , ReSiTi, ReSiZr, ReSiTa, NbReSi, C ₁₅ Re ₅ Y ₁₂ ,
190	GaMg ₂ , PdScSn, GaPtZr, GaHfPd, Li ₂ Sb, AlPtZr, AlHfPt, PtScSn, B ₄ Ga ₃ Pt ₉ , Ge ₂ O ₁₃ Rb ₃ U ₃ , K ₃ O ₁₃ Si ₂ U ₃ ,
191	AlB ₂ , Ag ₅ Sr, Au ₂ Ba, AuB ₂ , Ag ₅ Ba, B ₂ Nb, B ₂ Sc, Al ₃ Hf ₄ , Au ₂ Nb, Au ₅ K, B ₂ Ta, B ₂ Mo, Al ₃ Zr ₄ , B ₂ Y, Au ₅ Ba, Au ₅ Sr, CaGa ₂ , Be ₅ Zr, Bi ₂ Tl, Be ₅ Hf, Be ₂ Zr, Be ₂ Hf, Be ₅ Sc, BaPd ₅ , Hg, Hf, CaHg ₂ , NNa ₃ , Ga ₂ Y, Li ₂ NNa, Hg ₂ Na, BaGa ₂ , Hg ₂ Y, Si ₂ Y, LiNNa ₂ , CaPt ₅ , S ₂ Ti, Rf, N ₃ TaTi ₂ , Hg ₂ Sr, Hf ₂ N ₃ Ta, N ₃ OTa ₂ , N ₄ Ta ₂ , ScSi ₂ , N ₃ Ta ₂ Ti, NTA, PtTl, Au ₅ Rb, C ₆ Li, Pt ₅ Sr, SrZn ₅ , BN ₃ Ta ₂ , YZn ₅ , CN ₃ Ta ₂ , N ₃ TaZr ₂ , C ₁₂ Li, BaPt ₅ , N ₃ Ta ₂ Zr, NOTa, Ag ₇ Te ₄ , Si ₂ U, Ga ₂ La, Si ₂ Th, TiU ₂ , ThZn ₂ , Cd ₂ Th, C ₃ Si ₁₆ U ₂₀ ,
193	BGe ₃ Ta ₅ , Au ₆ Hg ₅ , BGe ₃ Nb ₅ , Br ₃ Zr, Cl ₃ Ti, AgSb ₃ Zr ₅ , AsPb ₃ Zr ₅ , Ga ₃ Nb ₅ , AsSb ₃ Zr ₅ , AlSn ₃ Zr ₅ , I ₃ Ti, Ga ₄ Ti ₅ , I ₃ Nb, Cl ₃ Zr, As ₃ Sr ₅ , CSb ₃ Zr ₅ , Ga ₃ Ti ₅ , Ga ₄ Zr ₅ , GaSn ₃ Zr ₅ , P ₃ Ti ₅ , Nb ₅ Si ₃ , CSn ₃ Zr ₅ , InPb ₃ Zr ₅ , In ₃ Y ₅ , Al ₃ Zr ₅ , Al ₃ Hf ₅ , SSb ₃ Zr ₅ , Pb ₃ SbZr ₅ , NSn ₃ Zr ₅ , Al ₃ Y ₅ , Ba ₃ N, AgIn ₃ Zr ₅ , AsSn ₃ Zr ₅ ,

Part 9 of all the predicted **Case 3**-TSMs:

193	<p>Pb₃Sc₅, HfI₃, Pt₃Zr₅, Pb₃Y₅, Ge₃Mo₅, Sb₄Zr₅, Ba₅Bi₃, BNb₅Si₃, Sb₃Zr₅, Pb₃SnZr₅, I₃Zr, Al₃Ta₅, Sc₅Si₃, Ga₄Nb₅, Sn₃ZnZr₅, Ge₃Nb₅, SiSn₃Zr₅, Ga₃Ti₂Zr₃, Sn₃Y₅, Ga₃Zr₅, Mo₅Si₃, Sb₃Y₅, Si₃Ta₅, BSn₃Zr₅, CdPb₃Zr₅, Ga₃Hf₃Nb₂, Hg₃Mg₅, Pb₃SiZr₅, Ga₃Sc₅, Sn₄Zr₅, Sb₃Sr₅, Ca₅Sb₃, AgPb₃Zr₅, Al₄Zr₅, Nb₅PSi₃, N₆Ta₅, Hf₅Sb₃Zn, Ge₃Sc₅, Sc₅Sn₃, Ga₃Y₅, Ge₃Ta₅, Pb₃SeZr₅, Sb₃SiZr₅, As₃Ca₅, PPb₃Zr₅, Ge₃Y₅, N₆Nb₅, Si₃Y₅, Ga₃Ta₅, Tl₃Y₅, SSn₃Zr₅, Bi₃Sr₅, PSn₃Zr₅, GePb₃Zr₅, Hf₅Si₃, Al₃Hf₅N, Sb₃SeZr₅, SeSn₃Zr₅, Hf₅Sn₃, Pt₃Y₅, Nb₅OPT₃, Hf₅Sn₄, Ba₅Sb₃, K₃Nb₈O₂₁, Au₄₁Mg₁₃, Al₄₃Mo₄Y₆, Ga₃Lu₅, Bi₅La₃Sc, Ge₃La₅, La₅Si₃, In₃Lu₅, La₅Sb₃, BrLa₅Sn₃, La₅Pb₃Zn, La₅PPb₃, La₅Pb₃Se, CGe₃Lu₅, Lu₅Sn₃, Ge₃U₅, Lu₅Tl₃, Pb₃Th₅, Lu₅Si₃, Bi₅La₃Mg, La₅Pb₃S, Sb₅TiU₃, Sb₅ScU₃, Ge₃Lu₅, Lu₅Pb₃, HfSb₅U₃, Sb₅U₃Zr, Lu₅Pt₃, CLa₅Pb₃, La₃Sb₅Zr, HfLa₃Sb₅, AgLa₅Pb₃, La₅Pb₃Sb, BrLa₅Sb₃, CLa₅Sn₃, La₅Pb₃, Bi₃BrLa₅, AsLa₅Pb₃, Bi₃La₅, ClLa₅Sn₃, La₃Sb₅Ti, Sn₄Th₅, Pb₄Th₅, ILa₅Pb₃, BrIn₃La₅, Al₃Ba₁₀Ge₇,</p>
194	<p>B₅W₂, BaNbS₃, C₅Al₃Zr₃, BW₄Zr₉, Hf₉Mo₄P, Cs₆K₇, Pb, Si, NbS, Ti, SeZr₂, Sb, Sc, Tl, Y, STi, Zr, PdSb, PdTe, Sr, PoTi, TeTi, SeTi, TeZr, PtSb, PtTe, PoSc, SbTi, ScTe, NbS₂, PbSrZn, PZr, NaTi, SrTi₂, S₂Ta, NbSe₂, Se₂Ta, NbPbS₂, PTi, O₂, PbS₂Ta, TiZn₂, Pt₂SnY, NbS₂Sn, S₂SnTa, PSbZr₂, PSbTi₂, SrZn₂, SnYZn, Pd₃Ti, Pd₃Zr, Pt₂Sn₃, Pt₂Si₃, Pt₂Sn₂Zn₃, Sn₅Ti₆, NbZn₂, Ag, AgBiCa, AgAsBa, AlZr₂, AlSc₂, AlYZn, AlPt₂Zr, AlHfPt₂, AlPtTi, Al₃Y, AsAuBa, AgBaBi, AgAsSr, AsPdSr, AsHf, AsZr, AgBiSr, Nb₄S₈Ti, Ag₂K, AuLiSn, AuCaSb, AuBaSb, AuBiSr, AuNaTe, AuSe, AuSn, AuRbTe, AuBaP, BLi, AuSbSr, AsTi, Al₂NaO₆Sb, AuKTe, Al₄Mg₂Zn₃, BaCdGe, BaGeZn, B₄Mo, BaHgSn, BaPt, AuCaP, BPt₂, AsPtSr, Au₂K, BiPd, BiPt, AuSnY, BaPbZn, BiIn₂, BaTl₂, Au₃LiNa₂, BiNa₃, AuMg₃, BaSiZn, BaMg₂, CaITi₂, Ba₃LiN, CaISc₂, CNb, CGaTi₂, BaSe₃Ta, CSc, CAsNb₂, BaSn₃, CInZr₂, BiRb₃, Br₃RbTi, CMo, BiK₃, CGaNb₂, AlN₃Ta₄, CPTa₂, CSTi₂, CGaSc₂, Br₃CsTi, CAINb₂, CSZr₂, CInTa₂, CInTi₂, YZn₅, CSc₂Tl, Ca, CGaMo₂, CTIZr₂, C₂S₂Ti₄, C₂S₂Zr₄, CSiTi₂, CaHgSn, Al₅Ba₄, CaIn₂, CaHgPb, Ba₃NNa, CdN, CaPbZn, B₄W, CaGa₂, CInSc₂, CdS₂Ta, CAITa₂, BaS₃Ta, CHF₂S, CAIW₂, CaSnZn, Cd₃Mg, CAIZr₂, C₂GeTi₃, CNb₂P, CaLi₂, CGaTa₂, CInNb₂, CTi₂Tl, Cd₃Sc, CHF₂Tl, GaPtTi, CHF₂In, B₅Mo₂, Ge, CaZn₂, Hf, Cl₃CsTi, CaMg₂, GaTi₂, GaYZn, HfPo, CaCd₂, Cl₃CsSc, CaPt₂, GeMg₂, Be₁₇Ti₂, Ga₂Mg, Be₁₇Hf₂, Y₂Zn₁₇, Cl₃RbTi, GaTi₃, CaHg₃, C₃AlNb₄, HgMg₃, K, InMoS₂, Hg₃Y, AuNa₂Sn₃, Li, Hf₂S, Hg₃Li, C₄Al₃Zr₂, InY₂, In₂Sr, InMg₃, GaNTi₂, InSc₂, In₃Sr, Hg₃Sc, Li₂SiZn, GeYZn, C₂AlTi₃, Mg₂Sn, N₂, NTa, NZr, MgZn₂, NNb, InTi₃, Mg₂Si, Na, NPt, NPd, Hg₃Sr, InS₂W, MoN, InSc₃, MgNa₂Pb, Mg₃Pt, Hf₂PSb, Mg₃Pd, KSn₂, MgNa₂Sn,</p>

Part 10 of all the predicted **Case 3**-TSMs:

194	LiTl, KPb ₂ , C ₃ AlTa ₄ , Mg ₂ PtSi, N ₂ Ta, C ₄ Al ₃ Hf ₂ , N ₃ W ₂ , Pd ₃ Ta, B ₄ Ta, BaNa ₂ , BMo ₄ Zr ₉ , KNa ₂ , CsI ₃ Ti, BaLi ₄ , CaNa ₄ Sn ₆ , Ga ₅ Ta ₆ , Mg ₂ Y, Mg ₂ Sr, HfZn ₂ , N ₂ Pt, AsHf ₉ Mo ₄ , Li ₃ Sn ₄ Zn ₂ , C ₆ Al ₃ Zr ₄ , C ₅ Al ₃ Hf ₃ , AsHf ₉ W ₄ , HfMo ₂ , GeHf ₉ Mo ₄ , Mg ₅ Pd ₂ , Hf ₉ Mo ₄ S, Hf ₉ SW ₄ , Hf ₁₀ Mo ₃ Si, Br ₉ Nb ₂ Rb ₃ , Hf ₉ SeW ₄ , BHf ₉ Mo ₄ , Hf ₉ Mo ₄ Si, Hf ₉ PW ₄ , CsK ₇ Rb ₅ , Mg ₃₈ Sr ₉ , Cd ₃ K ₁₆ Na ₉ Tl ₁₈ , Cd ₅₈ Y ₁₃ , Hg ₅₈ Sr ₁₃ , Cd ₅₈ Sr ₁₃ , Al ₃ Th, InLaZn, Lu, LaTlZn, Al ₃ La, AsLaPd, Ga ₃ Pd ₂ U, CdLaTl, GeLaLi ₂ , AlLa ₃ , Hg ₂ Th, Br ₂ La, PdSbU, LaPdSb, InLaPd ₂ , Hg ₃ La, La, Cd ₃ Th, InPt ₂ U, Hg ₃ Lu, PaPt ₃ , AuLaSb, AuGeU, Pd ₃ U, Al ₂ U, U ₂ Zn ₁₇ , Th ₂ Zn ₁₇ , LuZn ₅ , La ₂ Mg ₁₇ , Lu ₂ Zn ₁₇ , Cd ₁₇ La ₂ , B ₂ Re, B ₃ Re, NRe, CRe ₂ , Re, Be ₂ Re, CRe, C ₂ Re, NRe ₂ , N ₂ Re, Re ₂ W, B ₄ Re, Re ₂ Zr, GeHf ₉ Re ₄ , Hf ₉ PRE ₄ , N ₂ O ₅ , PRe ₄ Zr ₉ , BRe ₄ Zr ₉ , AsHf ₉ Re ₄ , Hf ₉ Re ₄ Si, BHf ₉ Re ₄ , Lu ₁₃ Zn ₅₈ , Cd ₅₈ La ₁₃ , AlTi ₃ ,
195	B ₁₂ ,
196	Li ₂₂ Si ₅ ,
197	Bi ₁₂ O ₂₀ Zn,
198	BaPdSi, AsPdS, BaPPt, Ba ₈ Ga ₇ , AlPd, AuBe, AlPt, BiPdSe, BiPdTe, AsPdSe, GaPd, BiPtTe, GaPt, AsBaPt, F ₂ Pd, HfSb, AuGaNb ₃ , HfSn, BiPtSe, AlAu ₄ , BaGePt, BaPtSi, GePtSr, CaPtSi, PdSbSe, PdSSb, AuGaTa ₃ , PdSbTe, PtSbSe, SbZr, PtSSb, PdSiSr, PtSiSr, Ga ₇ Sr ₈ , Al ₇ Sr ₈ , Al ₂ Sr ₃ , Ag ₉ GaSe ₆ , GaSr, ReSi, AlSr,
199	Bi ₂ Pd ₃ S ₂ , Bi ₂ Pt ₃ Se ₂ , N ₂ O ₄ ,
200	CdN ₃ O ₆ Tl, Po, HgN ₃ O ₆ Rb, HgN ₃ O ₆ Tl, Au ₆ In ₅ Na ₂ ,
201	O ₉ Sb ₃ Tl ₂ ,
204	P ₃ Pd, Ge ₁₂ Pt ₄ Th, Ge ₁₂ Pt ₄ U, Ge ₁₂ LaPt ₄ , Al ₁₂ Re, O ₃ Re,
205	AlSb, AsGa, AsIn, AuSb ₂ , AuN ₂ , Bi ₂ Pt, B ₁₂ , N ₂ Ta, NaO ₂ , Cl ₄ Pt, P ₂ Pt ₆ Sr, O ₂ Pa, C ₂ U, N ₂ Re, As ₄ Cl ₇ Hg ₆ Ti, As ₄ Br ₇ Hg ₆ Ti, Cl ₇ Hg ₆ P ₄ Ti,
206	C ₈ , As ₂ Zn ₃ , Ge, Si, Bi ₂ Mg ₃ , Lu ₂ N ₃ , N ₃ U ₂ ,
208	Na ₁₁ O ₁₆ U ₅ ,
210	O ₂ Si,
212	BLi ₂ Pd ₃ , BLi ₂ Pt ₃ , Ga ₅ LiO ₈ , Si ₂ Sr,
213	CaAl ₂ Nb ₃ , Au ₂ Nb ₃ , CaI ₂ Ta ₃ , Al ₂ NNb ₃ , Mo ₃ NPd ₂ , Mo ₃ NPt ₂ , Ba ₂₄ Ge ₁₀₀ , Ag ₃ AuS ₂ , Ba ₂₄ Si ₁₀₀ , CMo ₃ Re ₂ , CRe ₂ W ₃ ,
214	C, Br ₃ La ₃ Si, I ₃ La ₃ Pb, GeI ₃ La ₃ , O ₉ U ₄ ,
215	Al ₃ Li ₈ Si ₅ , C ₇ B, Li ₁₀ Pb ₃ , Ag ₉ In ₄ , Ca ₄ Hg ₉ ,
216	AuBe ₅ , AgAlLi ₂ , AgAsMg, AgBiLi ₂ , AgCdSb, AgLi ₂ Pb, AgLi ₂ Sn, AgMgSb, AgO, AgSe, Ag ₂ LiSn,

Part 11 of all the predicted **Case 3**-TSMs:

216	<p>AlBi, AlLi₂Pd, AlLi₂Pt, AlTi₂, AlTi₂Zn, AsCdLi, AlTi₃, AsIn, AsCsRb, AsTl, AuBiCa, AuBiLi₂, AuCdSb, AlMo₄S₈, AuGeLi₂, AuInLi₂, AuLiSb, AuLiMgSn, AuLi₂Pb, AuLi₂Sn, AuMgSn, AuN, AuPbY, BBi, BTi, Au₅Ca, BiGa, BiIn, BiLiMg, BiPdY, CAg, CCd, CMo, CNSi, CNb, CPd, CSc, CTa, CW, CY, CdLi₂Pb, CdN, CdPo, CdNa₂Pb, CGaMo₄S₈, CsNRb, CsPRb, GaLi₂Pd, GaLi₂Pt, GaMo₄Se₄Te₄, GaSb, GaMo₄S₈, GaMo₄Se₈, GaTi₂, GaTi₃, GaS₈Ti₄, GeInLi, GaNb₄Se₈, GeP, GeSc, HfN, GeTi₃, GaMo₄S₈Si, HgSe, GaNb₄S₈, HgTe, InLi₂Pd, InLi₂Pt, InSb, InTi₃, InTi₂, GaSe₈Ta₄, LiMgPdSn, LiMgPdSb, LiMgPtSn, LiMgPtSb, GaSe₄Ta₄Te₄, Li₂PdSb, Li₂PtSb, MgPtSb, MgPdSb, MoN, MoP, NPd, I₄Nb₄Se₄, NPt, NTi, INbSe, Li₂O₄S, NW, NZn, NZr, PSi, PTL, PoZn, PtScSn, RbSb, RbTe, SbSn, SbTl, ScSn, SiTi₃, SnTi₃, Pd₁₀Te₃, AuSTa₅, Mg₅Pd₁₀Si₁₆, Mg₅Pt₁₀Si₁₆, Ba₁₄Li₆N₆Na₁₀, Ba₁₄Li₅N₆Na₁₁, In₂Te₃, Li₂₂Si₅, Li₁₇Pb₄, BiLaPt, LuPtSb, AuPt₄U, PaPt₅, CRe, Cd₄₅Lu₁₁, Hg₄₅La₁₁, Li₁₇Si₄, Ge₄Li₁₇, AgLi₂Sb,</p>
217	<p>Ag₅Zn₈, Ag₅Cd₈, Al₁₂Mg₁₇, Ge₈Na₆Pt₈, Au₅Cd₈, Al₁₂Ta₁₇, Mg₂₄Y₅, K₁₀Pb₄₈, Pd₁₆S₇, OTa₂, In₅Na₂₄O₁₅, F₉U₂, Al₅Re₂₄, Re₂₄Sc₅, Re₂₄Ti₅, Mo₅Re₂₄, Re₂₄Zr₅, Hf₅Re₂₄, La₆P₁₇Pd₆,</p>
218	<p>Al₆K₈O₂₄Si₆, Al₆Na₈O₂₄Si₆,</p>
219	<p>C₄N₄Tl₂Zn,</p>
220	<p>Hf₃N₄, Li₁₅Si₄, Ge₄Li₁₅, Li₁₂Mg₃Si₄, Li₁₅Pd₄, Na₁₅Pb₄, Na₁₅Sn₄, Ge₃O₁₂Sb₄, O₃₆P₁₂Sc₄, As₃Ti₄, Al₃Li₁₂Si₄, Au₃Sb₄Y₃, Ba₄Bi₃, Bi₃Sr₄, C₃N₄, C₃Sc₄, Cs₄O₆, N₄Zr₃, Ge₃N₄, P₃Ti₄, Sb₃Y₄, Au₄Li₁₅, C₃Sc₂, C₃Y₂, Bi₄U₃, Bi₃La₄, La₄Pb₃, P₄Th₃, Se₄U₃, P₄U₃, As₄Pa₃, La₄Sb₃, Au₃Sn₄U₃, As₄Th₃, Pa₃Sb₄, La₃Se₄, Sb₄U₃, Pd₃Sb₄U₃, Bi₄Th₃, As₃La₄, Ge₃La₄, Te₄U₃, Pt₃Sb₄U₃, La₃Te₄, Sb₄Th₃, Pt₃Sn₄U₃, Bi₄La₃Pt₃, C₃U₂, C₃Th₂, C₃Lu₂, Ca₁₂Li₆N₁₆O₃Re₄, P₄Pa₃, As₄U₃, Au₃Lu₃Sb₄,</p>
221	<p>AuCl₃Cs, AuCa₃N, CaIPt₃, CInTi₃, CW, CY, CSc₃Tl, Cd₃In, Ca₃NPb, F₃Ta, Ga₃Sc, HfPt, InY, InPd₃, CPt₃Y, LiPb, BPt₃Sc, F₃Mo, MgPd₃, PSc, InNSc₃, CPbPt₃, TiZn₃, In₃Sc, Pd₃Sn, SnTi₃, NaO₃W, MoN, MgTl, MgY, NNb, NPd, NZr, NSc, NTi, NZn, NTa, NPd₃, NbZn₃, MoO₃Sr, NNa₃, Nb₃Si, MgSc, NaPb₃, NbO₃Sr, P, MgSr, NbO, PY, PbPd₃, N₄W₃, O₃SnTa, PdSc, PdZr, Po, PdTi, PtSc, Pb₃Y, Pd₃Ti, Pd₃Y, Pd₃Zr, PtZr, PtTi, SbSn, Sb, STl, SbSc, SbTl, ScZn, SbY, Se, SeTl, SrTe, Pt₃Ti, Pt₃Zr, SrTl, Pt₃Y, ZnZr, TiY, YZn, TiY, Sn₃Y, Tl₃Y, Pd₁₇Se₁₅, AgCd, AgMg, AgPt₃, AgSc, AgY, AgZn, Ag₃In, Ag₃Mg, Ag₃Pt, AlMo, AlPd, AlNTi₃, AlPt₃, AlZr₃, AlY₃, Al₃Li, Al₃Hf, Al₃Ti, Al₃Sc, Al₃Zr, As, AsSc, AuCd, AsY, AuMg, AuPd₃,</p>

Part 12 of all the predicted **Case 3-TSMs**:

221	<p>AuSc, AuTi, AuY, AuTi₃, AuZn, Au₃Li, Au₃Pd, BPbSc₃, BPd₃Sc, BInSc₃, BPd₃Y, BSc₃Sn, BSc₃Tl, BPt₃Y, B₆K, BaCd, BaHg, BaNbO₃, BaMoO₃, B₆Y, BaO₃Pb, BaZn, BePd, Bi, BiTl, Bi₃Sr, Br₃CsHg, CAITi₃, CAISc₃, CCaPd₃, CHf, CGaSc₃, CGaY₃, CInSc₃, CNTl, CInPt₃, CInY₃, CNb, CMg₃Zn, CPbSc₃, CPbY₃, CPt, CPd₃Y, CSc, CPd₃Sc, CPT₃Sc, CSnY₃, CTa, CSc₃Sn, CZr, CTIY₃, CTI₃Tl, Ca, CaCd, CaHg, CaIn, CaPb₃, CaTe, CaSn₃, CaTl, CaTl₃, Ca₃NSn, Ca₃Ntl, Ca₃Pb, CdN, CdSr, CdY, CdSc, Cd₃Nb, C₂₀, CsNO₂, CsIO₃, F₃KPd, F₃PdRb, F₃Nb, GaPt₃, GeNb₃, GeTe, HfPd, HfPt₃, Al₂Ca₃O₆, HgLi, HgSc, HgSr, HgTl, HgY, Hg₃Zr, Hg₃Tl, InPd, InMg₃, InSb, InPt₃, InNTi₃, InSc₃, InTe, InZr₃, In₃Mg, In₃Y, LiPd, CaHg₁₁, BaHg₁₁, Hg₁₁K, In₁₄K₃Mg₂₀, Hg₁₁Rb, Hg₁₁Sr, BiMg₆₄Si₃₁, AgLa, AsTh, AsU, AuLu, AlLu₃N, BInLa₃, BLuPd₃, AllLa₃, BLaPd₃, B₆La, AlLa₃N, BLaPt₃, BiTh, BiU, Ga₃U, CdLu, CLa₃Tl, InLa, HgLa, HgLu, In₃Lu, LaZn, Ga₃Lu, GaLaO₃, LuPd, LuPd₃, LuMg, LaTl, LuSb, LuPt₃, KO₃U, LuPb₃, LaTe, B₆Th, LuTl₃, In₃La, LaPd₃, O₃RbU, LaPb₃, LaPt₃, InLa₃, SbU, SbTh, TeTh, LaO₃Ti, In₃U, ThTl₃, La₃Tl, LaSn₃, La₃Sn, Si₃U, TeU, LaTl₃, CLaPd₃, InLa₃N, Tl₃U, Pb₃Th, CALLa₃, CLa₃Pb, InLu₃N, CLaPt₃, B₆Lu, CLu₃Sn, S₃U₄, Cd₁₁La, Cd₁₁Th, AlRe, CRe, NRe, ReTi, O₃Re, PbTi,</p>
223	<p>AlMo₃, AlNb₃, AsTi₃, AuTl₃, AuTi₃, AuNb₃, AuTa₃, AuZr₃, BeMo₃, Cl₃Na, GaMo₃, GaNb₃, CaO₄Pd₃, CdO₄Pd₃, GeMo₃, GeNb₃, AuZn₃, Ba₂Si₄₆, Ba₆Si₄₆, Ba₆Na₂Si₄₆, InNb₃, Ba₈Si₄₆, Mo₃Pt, Mo₃Si, NPd₃, Mo₃Sn, NaO₄Pd₃, Cs₃Hg₂₀, NaO₄Pt₃, Nb₃Pb, Nb₃Pt, Ga₁₆Ge₃₀Na₈, Nb₃Sn, Nb₃Si, Hg₂₀Rb₃, Nb₃Te, Nb₃Tl, OW₃, OW₃, Ge₃₀In₁₆K₈, O₄Pd₃Sr, K₈Si₄₆, O₄Pt₃, Ge₄₀In₆K₈, PdTi₃, PtTi₃, PtTl₃, Au₆Ba₈Ge₄₀, Pd₃S₄Y, SbTi₃, SnTa₃, Ba₄Ge₂₀Pd₃, SnZr₃, Au₆Ba₈Si₄₀, Ag₃Ba₄Ge₂₀, Au₃Ba₄Ge₂₀, Na₄Si₂₃, Ge₄₆K₈, Na₈Si₄₆, Ba₄Ge₂₀Pt₃, Cs₈Sn₄₆, Cs₄Sn₂₃, Cs₄Sn₂₃, K₈Sn₄₆, In₄₈K₃Na₂₆, In₄₈Na₂₆Rb₃, LaPd₃S₄,</p>
224	<p>OPb₂, Ag₂O, Ag₂O₃, Bi₂O₃, OPd₂, OZr₂, O₂Pt,</p>
225	<p>Br, NbO, O₂Pb, RbSb, Pt₇Sb, Ga₁₆Pd₇Zr₆, Al₄Sn₃Sr₁₁, Mg₂₃Sr₆, Hf, HgPo, GeLi₂Zn, LiS, Li, InSb, HgTe, HgSe, K, In₂LiPd, InPd₂Y, HgLi₃, KN, InPt₂Sc, InPt₂Zr, LiPd₂Sn, LiPbPd₂, KS, InTe, Mo, Li₂MgPb, InSr₃, LiMg₂Si, MoN, Mg₂Pb, Sb, SY, InP, TeY, SZr, Ti, In₂Pt, Zr, Li₃Pd, PSn, Pd, Si, MoP, Y, Sc, Pt, Nb, OZr, NZn, NZr, NTi, NNB, Ta, PZr, NPd, Li₂SnZn, OTi, NNa, MgP₂Si, NaS, OTa, Rf, NW,</p>

Part 13 of all the predicted **Case 3**-TSMs:

225	<p>Li₃Tl, Li₂MgTl, NTa, OPt, NPt, SSC, In₂LiPt, PoY, ScSe, LiPd₇, SbSn, SeY, P₂SiZn, NPd₃, InLi₂Mg, Pd₂ScSn, Pd₂SnY, PbPd₂Y, RbTe, Pt₂ScSn, INaO₆Pb₂, LiPt₇, MoZn₆, MoZn₇, Li₂₃Sr₆, In₈N₇Sr₁₉, AgAuCd₂, AgAuZn₂, AgAuCl₆Cs₂, AgCs₂F₆K, AgN, Ag₂AlSc, Ag₂CdMg, Ag₂GeLi, Ag₂InLi, Ag₂InMg, Ag₂InSc, Ag₂InY, Ag₂LiSn, Al₁₆Hf₆Pt₇, AlAu₂Hf, AlAu₂Ti, AlTiZr₂, Al₂Au, Al₂LiPt, Al₂Pt, AsIn, AsSn, AsTe, AsZr, AuGa₂, AuIn₂, AuN, Au₂HfIn, Au₂InTi, Au₂InZr, B₁₂Sc, Al₁₆Pt₇Ti₆, B₁₂Y, B₁₂Zr, BBe₂, BZr, Ba₂CaO₆Re, Ba₂CdO₆Re, Ag₈Ca₁₉N₇, Ba₂O₆SbSc, Ba₂O₆ReY, Ba₂O₆ReZn, BeP₂Si, Be₂Si, BiK₃, BiO₂, BiSe, BiTe, Br₆Cs₂W, Br₆K₂Re, Ba₆Mg₂₃, CAg, CCo, CMO, CNb, CSc, CTi, CRE, CTa, CY, Br₆Rb₂W, Ca₃In, Ca₃Tl, Ca₂O₆PdW, Ca₆GeLi, CdGeLi₂, CdGeP₂, CdLi₂Pb, CdN, CdP₂Si, Cd₃Y, Cl₆Cs₂Mo, Cl₆Cs₂Re, Cl₆Cs₂Ta, Cl₆Cs₂W, Cl₆K₂Mo, Cl₆K₂Re, Cl₆K₂Ta, Cl₆MoTl₂, Cl₆NbRb₂, Cl₆K₂W, Cs, Cl₆Rb₂W, Cl₆Tl₂W, Cs₂F₆KMo, Cs₂F₆KTi, Cs₂F₆MoTl, Ca₁₉In₈N₇, F₂Ti, F₆KMoRb₂, F₆K₂MoNa, F₆KMoTl₂, F₆KRb₂Ti, F₆MoNaRb₂, F₆K₃Mo, F₆MoNa, F₆MoNaTl₂, F₆NaRb₂Ti, F₆K₃W, F₆TiTi₃, F₆TiZr, Ga₂LiPd, GaPd₂Sc, Ga₂Pt, Ga₂LiPt, GeLiMg₂, GeLiPd₂, GeLi₂Pd, GeHgLi₂, Ga₁₆Hf₆Pd₇, Ga₁₆Pt₇Zr₆, Ga₁₆Pt₇Ti₆, Ga₄Sn₃Sr₁₁, BBr₂₀K₈Zr₆, Ac, AsPa, AsTh, Au₂InU, AsU, Au₂SnU, Au₂InTh, Ag₂InLa, CPa, CU, CTh, C₂U, OU, OPa, NU, PTh, La, NTh, LaN, SeTh, LaS, PU, LuSe, LuS, LaSe, LuTe, Th, LuPo, InLuPd₂, LuPd₂Sn, SbTh, SbU, LaMg₃, B₁₂Lu, Cl₆Cs₂NaU, Lu₆Zn₂₃, AlLa₆Mg₂₂, Mg₂₃Th₆, Cd₂₃Th₆, NRe, Re, Ba₂MgO₆Re, Pt₂₃Si₁₁U₃, U,</p>
226	<p>Be₁₃Sr, Be₁₃Sb, Be₁₃Sc, BaBe₁₃, CaZn₁₃, Be₁₃Ca, Be₁₃Zr, Be₁₃Hf, LiZn₁₃, Be₁₃Y, KZn₁₃, NaZn₁₃, RbZn₁₃, BaZn₁₃, BeZn₁₃, Cd₁₃Cs, Cd₁₃K, SrZn₁₃, Mo₇Sn₁₂Zn₄₀, Be₁₃Lu, Be₁₃La, Be₁₃Th, LaZn₁₃, Cd₁₃Rb,</p>
227	<p>Ca₂FO₆Ta₂, NZn₃Zr₃, NTi₃Zn₃, AgBe₂, Ag₂Na, Be₂Nb, B₂Sc, Au₂Na, Al₂Sc, CaPd₂, CaLi₂, Be₂Ta, CaPt₂, Al₂Y, Bi₂Rb, BaPd₂, As₂Na, Au₂Pb, Au₂Bi, BaPt₂, Bi₂K, Bi₂Cs, Ge, AgIn₂Na₃, LiZn, InLi, HfW₂, InNa, Mo₂Zr, LiPt₂, HfMo₂, CsO₆W₂, NaPt₂, In₂₄S₃₂, BiF₄K, Pd₂Sr, Pt₂Sr, O₄PdZn₂, Sn, Pt₂Y, YZn₂, LiO₄Ti₂, W₂Zr, PdSc₂, O₇Pb₂Sb₂, S₄Zr₃, ILi₇N₂, O₆Pb₂Sn₂, NNb₃Zn₃, NaO₃Sb, AlMg₃Pt₂, Hf₂Pt, AuIn₂Na₃, O₄Sb₂, O₅Sb₂, OPd₂Zr₄, HfZn₂₂, PtZr₂, AsPd₅Sb, Ge₁₃₆K₂₄, CZn₃Zr₃, Al₁₈Mg₃Ta₂, CHf₃Zn₃, Zn₂₂Zr, BMg₈Pt₄, Ba₁₀Ga, LuS₂, Al₂U, Al₂Lu, Al₂La, LaPt₂, LaMg₂, Cs₂O₁₂U₄, Be₂₂Re, Al₂BRe₃, NRe₂Zr₄, Al₂₀LaTi₂, CTi₃Zn₃, CsGe₁₇Na₂, CdLi, Na₂RbSi₁₇,</p>
229	<p>Se, W, Al, Ba, Ca, Bi, AuSb₃, Cs, Hf, Mg, Li, Mo, K, Na, Nb, Rb, Sb, Sn, Ti, Ta, Sr, Tl, Zr, Ca₅Ge₆Pd₆, Ag₈Ca₃, O₄Pt₃, F₁₅Nb₆, In₇Pt₃, Ga₁₂PtY₄, Ga₇Pd₃, Al₁₄Mg₁₃, In₇Pd₃, Ga₇Pt₃,</p>

Part 14 of all the predicted **Case 3**-TSMs:

229	Sb ₂ Tl ₇ , Mo ₃ Sb ₇ , Ca ₁₇ Hg ₉ Li ₆ , La, Th, Lu, Cd ₄ La ₆ Pd ₁₃ , Ga ₁₂ Lu ₄ Pd, Ga ₁₂ PdU ₄ , La ₆ Pd ₁₃ Zn ₄ , K ₄ O ₁₂ SrU ₃ , As ₇ Re ₃ , U,
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Note that materials in **Cases 1** and **2** can also have band crossings located near the Fermi energy. We list the potential materials with such properties in the following table. Blue and red colors respectively denote **Cases 1** and **2**.

Part 1 of all the predicted materials with band crossings from **Cases 1** or **2**:

TABLE VIII. Materials with band crossings in **Cases 1** or **2** (in blue or red, respectively): The band crossings for the materials listed here could be far from the Fermi energy, and the material might have a continuous direct gap or even a full band gap. One must further examine the actual band dispersions in understanding the prospect of these materials as TSM candidates.

SG	Materials
1	AlCl ₇ Se, Al ₂ Li ₂ O ₁₂ Si ₄ , Al ₂ O ₄ Pb, AsKSe ₂ , Au ₂ Te ₃ , B ₂ Cd ₂ O ₅ , B ₃ BiO ₆ , BaBeFO ₄ P, BaF ₁₂ Sb ₂ , BaI ₄ O ₁₂ Pd, BeP ₂ , C, CLiNaO ₃ , CaGe ₂ O ₅ , Ca ₈ In ₃ , Cl ₄ Cs ₂ Hg, Cl ₇ N ₂ SbSe ₃ , Cs ₁₀ K ₆ Pb ₃₆ , Cs ₄ Mo ₃ O ₂₀ U ₃ , F ₄ NO ₃ RbTe, F ₆ Na ₂ Si, F ₆ Na ₂ Ti, Ga ₂ O ₁₁ Te ₄ , Ga ₂ O ₄ Pb, IKO ₃ , KSbSe ₂ , LiN ₂ Na ₅ , O ₁₁ Sr ₃ Te ₄ , O ₂ Si, O ₂ Ti, O ₆ Sb ₂ W, O ₈ Se ₂ Te ₂ , P ₂ PtSi ₃ , Pb ₄ S ₁₃ Sb ₆ , RbS ₂ Sb, RbSbSe ₂ , S ₄ SbTl ₃ ,
2	Si ₂ Te ₆ Tl ₆ ,
3	GeO ₅ Pb ₃ , O ₂ Si,
4	Ag ₂ S, AlBaF ₅ , AlCl ₄ K, AlCl ₆ I, Al ₂ O ₁₂ W ₃ , Al ₂ O ₄ Sr, Al ₇ S ₁₂ Tl ₃ , AsCsF ₄ , AsF ₁₂ LiXe ₃ , AsLiMoO ₆ , AsO ₄ TlZn, AsS ₂ , As ₂ Ba ₂ Se ₅ , As ₂ CdHg ₄ I ₄ , As ₂ Cs ₂ Se ₉ Sn, As ₂ K ₃ LaO ₈ , As ₂ O ₃ , As ₂ Pb ₂ S ₅ , As ₈ Pb ₈ S ₂₀ , AuBrF ₆ , AuNa ₅ Se ₁₂ , B ₄ GeO ₉ Rb ₂ , BaMo ₂ O ₉ Te, BaMo ₃ O ₁₀ , BaNa ₂ O ₆ Si ₂ , BaO ₉ TeW ₂ , Ba ₂ Cl ₇ Sc, Ba ₃ P ₄ Sn ₂ , BiCl ₅ Hg ₄ S ₂ , BiInS ₃ , BiKP ₂ S ₆ , BiKP ₂ Se ₆ , BiP ₂ S ₆ Tl, BiPd, Bi ₄ Br ₂ O ₅ , Bi ₄ I ₂ O ₅ , Br ₁₀ Re ₂ Te ₆ , Br ₄ K ₂ Zn, C ₂ F ₄ Te ₂ , C ₂ N ₂ S ₉ , CaGe ₂ Pt ₂ , CaN ₂ O ₂ Si ₂ , CaO ₃ Te, Ca ₂ Nb ₂ O ₇ , Ca ₄ FN ₂ NbO ₁₇ Si ₄ Zr, Cd ₂ O ₁₂ Rb ₂ S ₃ , ClFO ₇ Pb ₂ Se ₂ Ti, ClHg ₂ O ₁₂ Rb ₃ S ₃ , ClHg ₂ O ₁₂ S ₃ Tl ₃ , ClNbO ₈ Pb ₂ Se ₂ , Cl ₂ N ₂ S ₃ , Cl ₆ Hg ₆ In ₂ P ₃ , Cs ₂ HgI ₄ , Cs ₄ O ₃ Pb, F ₁₂ Sb ₂ Xe, F ₂₁ Rb ₅ Zr ₄ , F ₂ O ₇ Te, F ₃ KOTe, F ₇ SnY, GeKS ₄ Y, GeN ₂ OSi, GeO ₅ Pb ₃ , HfNO ₃ Ta, HgI ₂ O ₆ , Hg ₃ O ₁₀ SeTe ₂ , Hg ₃ O ₁₀ Se ₃ , ILiMoO ₆ , I ₄ O ₁₂ Zn ₂ , I ₄ Tl ₂ Zn, InK ₂ LiMo ₃ O ₁₂ , InP ₂ S ₆ Tl, In ₆ Se ₇ , KLiO ₅ Si ₂ , KP ₂ S ₆ Sb, KP ₂ SbSe ₆ , KS ₄ SiY, K ₂ Mo ₃ Se ₁₈ , K ₂ O ₁₅ Si ₆ Ti, MoO ₂ , MoO ₇ TeZn ₂ , NaP ₂ S ₆ Sb, Na ₂ O ₈ Si ₃ Zn, Na ₂ Se ₉ Ti ₂ , O ₁₁ P ₂ W ₂ , O ₁₅ Pb ₄ SSi ₃ Zn ₂ , O ₅ Te ₂ , P ₂ PtSi ₂ , P ₂ S ₆ SbTl, P ₂ SbSe ₆ Tl, P ₂ Se ₆ TlY, P ₄ S ₅ , SbSe ₂ Tl, Se, Te,
5	AgS ₂ Sb, Ag ₂ Mo ₃ O ₁₆ Te ₃ , Al ₁₇ Mo ₄ , AlAs ₂ LiO ₇ , Al ₄ O ₁₅ Sr ₆ Y ₂ , Al ₄ P ₆ S ₁₈ , Al ₆ F ₂₁ NaRb ₂ , AsPd ₅ , As ₂ GaLiO ₇ , As ₂ LiO ₇ Sc, As ₂ Mo, As ₂ NaO ₇ Sc, As ₂ Nb, As ₂ Ta, AuCsI ₄ O ₁₂ , Au ₄ KO ₁₂ , Au ₄ O ₁₂ Rb, BB ₂ FO ₃ , BB ₂ F ₂ KO ₃ , BB ₂ F ₂ O ₃ Rb, B ₃ BiO ₆ , Bi ₁₀ Mo ₃ O ₂₄ , Bi ₁₄ Mo ₅ O ₃₆ , BiO ₃ Sc, Bi ₇ F ₁₁ O ₅ , BrHg ₃ ITe ₂ , Br ₂ NbO, Br ₄ NbOTl, CCaO ₃ , CK ₄ O ₄ , CLi ₄ O ₄ , CNa ₄ O ₄ , C ₃ AsN ₃ , CaO ₇ Si ₂ Zr, CdNa ₂ S ₄ Sn, GaNbO ₄ , Ga ₂ Ge ₃ O ₁₀ Rb ₂ , GePd ₅ , Ge ₂ Hg ₃ K ₂ S ₈ , Ge ₄ O ₉ Pb, Ge ₉ Li ₄ O ₂₀ , Hg ₂ P ₂ S ₇ , I ₂ NbO, I ₃ NbO, InKP ₂ S ₇ , LiN ₂ Na ₅ , MoO ₄ Tl ₂ , Mo ₃ Na ₂ O ₁₆ Te ₃ , Na ₄ O ₉ Si ₃ Sr, Nb ₂ O ₅ , O ₁₄ PtSi ₂ Sr ₈ , O ₂ Si, O ₅ Ta ₂ , P ₂ S ₇ ScTl, PbS, Pb ₃ Pd ₅ , Po, Re ₂ Sc ₃ Si ₃ ,
6	BO ₃ Y, BaBe ₂ O ₇ Si ₂ , CGa ₃ N ₃ Si, C ₃ GaN ₃ Si, CsIO ₃ , CsI ₄ Li ₃ , Li ₃ N ₂ Na ₃ , Li ₅ N ₂ Na, NO ₂ SiY, NbSe ₃ , O ₂ Si,
7	Ag ₇ S ₆ Ta, CLi ₄ O ₄ , Ca ₁₄ F ₂ Nb ₂ O ₃₄ Si ₈ , HgO ₄ S, O ₃ W,
8	B ₃ Ca ₄ LaO ₁₀ , N ₂ Re,
9	Al ₁₅ La ₃ O ₃₇ Ti ₅ , N ₃ Na ₄ Re,
11	AgBi ₂ ClS ₃ , AgBi ₂ ClSe ₃ , AgBr, AgCl, AgHfRbTe ₃ , AgI, Ag ₂ Cs ₃ S ₈ Sb ₃ , Ag ₂ O ₆ Te ₂ , Ag ₈ BaS ₅ , AlAs ₃ Cl ₄ S ₅ , AlAu, AlCl ₆ NS ₂ , AlCs ₆ Sb ₃ , AlF ₄ K, AlI ₄ In, AlRb ₆ Sb ₃ , Al ₂ As ₃ K ₃ , Al ₂ CaO ₄ , Al ₂ Na ₇ Sb ₅ , Al ₃ F ₁₂ NaRb ₂ , AsAuK ₂ S ₄ , AsCs ₂ NaO ₄ , AsF ₅ N ₄ S ₄ , AsF ₈ Sb, AsO ₄ Sb, As ₂ Te ₃ , As ₃ BrO ₆ Pb ₂ , As ₃ Cs ₆ In, As ₃ F ₆ SbSe ₄ , As ₄ S ₅ , AuK ₂ PS ₄ , AuPS ₄ Tl ₂ , AuSr, Au ₂ BaSb ₂ , BB ₂ Li, BBr ₃ P ₄ S ₃ , BS ₃ Tl ₃ , BSe ₃ Tl ₃ , BaBi ₂ Pd ₂ , BaIn ₂ P ₂ , BaNaO ₇ ScSi ₂ , BaO ₁₀ Sc ₂ Si ₃ , BaO ₁₀ Si ₃ Y ₂ , BaO ₃ Se,

Part 2 of all the predicted materials with band crossings from **Cases 1 or 2**:

11	<p>BaO₃Te, BaPd₂S₄, BaS₃Sn₂, BaSb₂, Ba₂BrP₇, Ba₂ClF₇Zn₂, Ba₂ClP₇, Ba₂GaGeN, Ba₂GeSe₂Te₂, Ba₂GeSe₄, Ba₂IP₇, Ba₂LiN₄Re, Ba₂Se₄Si, Ba₂SiTe₄, Ba₃Bi₆PbSe₁₃, Ba₃Ge₂N₂, Ba₄Cl₂N₄W, Ba₄Ga₂S₇, Bi, BiCdClO₂, Bi₂Ga₂In₄S₁₂, Bi₂In₄S₉, Bi₂Pd₂Sr, Bi₆Se₁₃Sr₄, Bi₇In₃Pb₄S₁₈, Bi₈Cs₂Se₁₃, Bi₈Rb₂Se₁₃, Br₃GaLi, Br₃Nb₃Se₁₀, Br₄K₂Zn, Br₅CsHg₂, Br₉TaTe, CAgNO, CAg₂O₃, CaF₃K, CaSb₂, Ca₂O₁₂Si₄Zr, Ca₅N₄O₂W, Ca₇N₉NbSi₂, CdCs₂I₄, Cl₁₂Re₂S, Cl₁₃PRE₂, ClF₅NRe, ClIn₅S₅, ClIn₅Se₅, ClKO₃, Cl₂O₁₁Te₆, Cl₃GeRb, Cl₃N₃S₃, Cl₃Nb₃Se₁₀, Cl₆Pd₆S₆, Cl₇CsTi₂, Cl₇Nb₃Se₅, Cs₂HgI₄, Cs₃I₄Li, Cs₆GaSb₃, F₁₁In₃Rb₂, F₁₄Sb₄, FKO₂S, FKO₂Se, FLiO₄SiSi₂, FO₃SeY, F₄MgSr, F₇In₂K, F₇PbTa, F₇SrTa, F₈LiNaY₂, GaGeNSr₂, GaGe₂Na₅, Ga₃Li, Ga₅Pt, GeHfPd, GeS₄Sr₂, Ge₂N₂Sr₃, Ge₄K₄Se₁₀, HfS₃, HfSe₃Tl₂, HfTe₃, I₂Zr, I₉Re₃, InNa₅S₄, In₂S₇Sn₃, In₅S₆Tl, In₅S₇Tl, In₅Se₇Tl, In₆S₇, In₆Se₇, K₂O₅S₂, K₄P₈Te₄, LaS₃Y, LiN₄ReSr₂, Li₂O₇Ti₃, Li₄S₄Si, MgZn₂, MoO₃, MoTe₂, Mo₂O₉Zn₃, Mo₂S₃, N₂O₄, NaNb₃O₁₆Te₄, Na₂O₇Ti₃, Na₂P₂S₆, NbPt₃, Nb₂P₂Rb₂S₁₁, Nb₂Se₃, O₂Te, O₃P₄S₆, O₃PbS, O₃PbSe, O₃Pb₂, O₃PdSe, O₃SeSr, O₃Tl₄, O₆P₄, O₆Pb₃S, O₇PbTi₃, O₇Si₂Y₂, O₉S₂Zn₃, P₄S₅, P₄S₆, P₅Y, PbS, Pb₉Rb₄, Pt₃Ta, Pt₆Si₅, S₃Ti, S₃Tl₂Zr, S₃Y₂, S₄SiSi₂, S₇Sb₄Sn, Sb, Sb₂Sr, Se₃Ta, Se₃Ta₂, Se₃Zr, Sn₂SrZn₂, Te₃Zr,</p>
13	<p>Al₂Cl₈Sr, Br₃NbSe, Br₆Nb₂Se₂, Cl₃NbSe, FMO₂O₇Y, I₄Zr, I₆Nb₂Te₂,</p>
14	<p>Ag₂HgS₂, Ag₂O₃S, Ag₂Te, AlBr₃, AlCaF₅, AlCl₄Li, AlI₃, AlNa₃S₃, Al₂B₂Cs₂O₇, Al₂Br₆, Al₂Br₆N₂Se₂, Al₂Cl₆OSn, AsBaKSe₃, AsISe, AsLuSe, AsNaS₂, AsSY, AsSeY, As₂F₁₂Hg₃, As₂F₈O₂Rb₂, As₂Pt₂Sr, As₂S₃, As₂Se₃, AuCl₃, AuTe, AuI₄Li, AuNaSe₂, BN, B₂Mg₂O₅, BaBeLa₂O₅, BaGa₂Pt₂, BaKSbSe₃, BaNb₂O₆, BaP₂, BaS₂Sn, Ba₂Br₅Cs, Ba₂ClCs₄Sn, Ba₃P₁₄, BeLiN, Bi, BiBr₃, BrInTe, Br₂O₅Sb₄, Br₃Ga, Br₆Hg₃Se₂Zr, CF₄, CKNSe, C₂Ca, C₂Cl₄S₂, C₇Y₄, Cd₂K₂O₃, Cl₂MgO₈, Cl₂OS, Cl₂O₅Sb₄, Cl₂Te₃, Cl₄Hg₄I₂S, Cl₄IK, Cl₆Hg₃S₂Zr, FGaO₃Te, FMO₄Y, FO₃SeY, F₄Zr, GaI₃, HfO₂, Hg₂MoO₄, Hg₂O₃Se, InTe, lLiO₄, I₂Pd, I₂Pt, I₃Sb, I₅Nb, I₆In₂, KNaO₂Zn, KPS₄Sn, K₂O₇W₂, K₂Se₃Te, LaSbSe, LiP, Lu₂O₅Si, NOTa, Na₂O₃Zn₂, Na₂Se₃Sn, O₂Ti, O₃Pb₂, O₃S, O₆Se₂Ti, O₇P₂Sn₂, O₇Rb₂W₂, O₇Si₂Y₂, Rb₂S₇Sb₄, Rb₂Te₃Zr,</p>
15	<p>AllaO₃, B₄O₈U, Ba₂Re₆S₁₁, Be₂La₂O₅, Br₆Cs₃La, Br₆In₂Th, C₂Br₁₀La₆, C₃K₄O₁₁U, Cl₁₁NRe₂S₂, ClLa₃O₈Si₂, ClLa₃S₈Si₂, Cl₅Pa, Cl₆ReTe₈, Cs₂F₇Pa, Cs₂Re₃Se₆, Cs₄Re₆S₁₃, Cs₄Re₆Se₁₃, F₃La₂LiO₈S₂, F₄LiLu, F₇K₂Pa, F₇PaRb₂, GaLa₂N₃, lLa₃S₈Si₂, I₄U, InS₂Tl, In₂Na₆S₆, In₂Te₅, KNaO₃Ti, KO₂Sb, KO₈W₂Y, KS₂Sb, K₂MoO₂S₂, K₂Mo₃O₁₀, K₂Mo₃O₁₂Th, K₂O₄Zn₃, K₂O₇Se₂, K₂Rb₂Re₆S₁₃, K₂Re₃S₆, K₂Re₃Se₆, K₂S₃Ti, K₂S₅Sn₂, K₂S₇Sb₄, K₂Se₅Sn₂, K₃NaO₈W₂, K₄Re₆Se₁₂, K₄S₁₄Ti₃, K₆Nb₄S₂₂, K₆S₂₂Ta₄, K₆Sb₃Tl₂, La₂O₁₁Te₄, LiMo₂O₈Sb, LiO₆ScSi₂, LiO₈Ta₃, LiS₂Sb, Li₂O₃Pb, Li₂O₃Sn, Li₂O₃Te, Li₂O₃Ti, Li₂O₃Zr, Li₂O₄W, Li₂S₃Sn, Li₃Na₅S₈Ti₂, Li₃O₄Ta, Li₄O₅Se, Li₆O₇Zr₂, LuO₄Ta, MgO, Mg₂O₈Te₃, MoNa₂O₁₂Te₄, MoO₂Rb₂S₂, MoO₆Y₂, MoP₄, Mo₂O₈Zr, Mo₃Na₂O₁₂Zr, Mo₃O₁₀Rb₂, Mo₇O₂₂Tl₂, N₂OSi₂, N₂O₂S₂Se, N₂O₂S₃, N₃NbSr₂, N₃Sr₂Ta, N₄Se₄, N₆S₅, NaNb₂PS₁₀, NaO₂Y, NaO₃RbTi, NaO₆ScSi₂, NaS₂Sb,</p>

Part 3 of all the predicted materials with band crossings from **Cases 1 or 2**:

15	<p>NaSi, Na₂Nb₄O₁₁, Na₂O₁₁Si₄Zr, Na₂O₁₂Te₄W, Na₂O₃Pt, Na₂O₆Si₂Zn, Na₂O₇Sb₄, Na₂O₇Si₃, Na₂Re₃Se₆, Na₂Re₃Se₆, Na₂Se₃Te, Na₂Sn₄Sr, Na₄O₁₀Te₄, Na₄S₈Sn₃, Na₄Si₄, Na₅NbO₅, Na₅O₅Ta, Na₆S₇Sn₂, Na₆Sb₄Tl, Na₆Se₇Si₂, Na₆Se₇Sn₂, NbO₄Y, Nb₂O₅, Nb₂O₆Sn, O₁₁Te₄Y₂, O₂RbSb, O₂Si, O₃SiZn, O₄PdS, O₄PdSe, O₄Rb₂Zn₃, O₄Sb₂, O₄WZn, O₅Pb₂Te, O₅PdSe₂, O₅STi, O₅Sb₂, O₅Ta₂, O₅Ti₃, O₆Pb₂SbY, O₆Sn₃W, O₆TeZn₃, O₇Rb₂Se₂, O₇SnTa₂, O₈P₂Pb₃, O₈P₄, O₈Te₃Zn₂, O₉Rb₆Te₂, O₉Si₃Sr₃, P₂Pt₅, P₂Rb₄Se₉, P₂S₇Zr, P₄S₄, P₆Pt₄Sr, PbS₄Tl₂Zr, PbSe₄Tl₂Zr, Pb₃S₁₅Sb₈, Pb₅S₁₇Sb₈, Pb₉Pd₁₃, Rb₂Re₃S₆, Rb₂Re₃Se₆, Rb₂Se₅Sn₂, Rb₄Re₆S₁₂, Rb₄Re₆S₁₃, Rb₄Re₆Se₁₂, Rb₄S₁₄Ti₃, Rb₄Se₁₄Zr₃, Rb₄Te₁₆Zr₃, Re₂Sc₃Si₄, Re₃S₆Tl₂, Re₃Se₆Tl₂, Re₆Se₁₂Tl₄, S₁₀, STa₆, S₃Sn₂Tl₂, S₅Sn₂Tl₂, Sb₂Te₃, Se₃Tl₂, Se₄SiTl₄, TeTl₂, Te₃Tl₂,</p>
16	AlPS ₄ , C ₁₁ N ₄ ,
17	Ag ₂ Se, B ₁₈ Cs ₂ O ₂₈ , C ₂ BN, F ₁₀ In ₃ Rb, NaNbO ₃ ,
19	<p>AgCsSe₄, AgHgIS, AgLuSe₂, AgNO₃, AgRbSe₄, AgScSe₂, AgSe₂Y, Ag₂GeO₃, Ag₂INO₃, Ag₂O₃Si, Ag₂O₃Sn, Ag₂S, Ag₂Se, Ag₃B₅O₉, Ag₃IN₂O₆, Ag₄P₂S₆, AlBaF₅, AlBaLaO₄, AlCl₄Na, Al₂Ca₃N₄, Al₂N₂O₃SiSr, AsBr₃, AsClO₂Pb, AsCl₃, AsCl₃F₆S, AsK, AsKM₄O₁₅, AsKO₃, AsKO₉W₂, AsNa, AsNaO₉W₂, AsO₅Sb, AsRb, As₂F₁₂Se₄Te₂, As₂Na₄Te₄, As₂O₅, BG₂KO₆, B₂BaO₆Zn₂, B₂Ba₃N₄, B₂Ca₂O₅, B₂O₇Se₂, B₃F₃Li₂O₄, B₄LiO₇Rb, B₆Cs₂O₁₀, BaBiSe₃, BaF₅Ga, BaGeO₃, BaGeO₄Pb, BaN₂O₄, BaO₃Si, BaSbTe₃, Ba₅N₆Si₂, Ba₆Se₁₃Sn₆, BeCaFNaO₆Si₂, BeF₃Rb, BiClO₃Se, BiCl₂KO₄S, BiSe₃Sr, Bi₂I₄O₁₃, Bi₄Cl₁₄Se₁₀, BrNO₃, Br₃Sb, Br₄CsTl, Br₄InNa, Br₅PbTl₃, CO₂, CO₄Pb₂, C₂F₂O₃, C₂F₅O₄RbSb₂, C₂N₂Se₂, C₄AlBa₂LiN₈, C₄BF₁₂K, C₄O₄Tl₂, CdCs₂Ge₃Se₈, CdCs₂Se₈Sn₃, CdI₂O₆, Cd₂O₁₂Rb₂S₃, Cl₁₄Ga₃Sb₇Se₈, ClF₃Sn₂, Cl₂S, Cl₂Si, Cl₄Cs₂Hg, Cl₄GaNa, Cl₅N₃OP₂S, Cl₅N₃S₄Se, Cs₁₁O₃Rb₇, CsSb, Cs₂Ge₃MgSe₈, Cs₂Ge₃Se₈Zn, Cs₂Ge₃Te₈Zn, Cs₂HgS₈Sn₃, Cs₂HgSe₈Sn₃, Cs₂MgSe₈Sn₃, Cs₂S₅, Cs₂Se₅, Cs₂Se₈Sn₃Zn, F₁₀IN₃O₃, FIO₂, F₂Ge, F₂Sn, F₃K₂O₄SSb, F₄S, F₄Se, F₄Te, F₅Na₂Sb, F₆Na₃NbO, GeI₃Rb, GeO₄PbSr, ISSb, I₅PbTl₃, KLi₂NaO₈S₂, KP, KP₂Se₆Y, K₂S₅, K₂Se₅, LaN₅Si₃, La₂O₆Te, Li₃P₇, MoNa₄O₁₄S₃, NaP, Na₄SnTe₄, NbO₅RbSi, O₂Rb₂Sn, O₂Si, O₂Te, O₃Sb₂, O₃Xe, O₄SeTl₂, O₆TeY₂, O₆WY₂, PPbRbS₄, RbSb, Rb₂S₅, Rb₂Se₅, S₁₇Sb₆Sr₆, S₅Tl₂,</p>
20	<p>AgAsK₂, AgAsNa₂, AgBiK₂, AgK₂Sb, AlF₅Tl₂, AlO₄P, AsGaO₄, B₃Ba₃BrO₉Pb₂, B₅Cs₂Li₃O₁₀, BaNb₂O₆, BaO₃Ti, Ba₆OS₁₅Ti₅, BeLi₂O₄Si, BeO₆P₂, Bi₂K₄Zn, Br₄Cs₃Li, CCaO₃, CMgO₃, CdO₁₀Pb₆Te, ClF₅GeO₂, FInO₅Te₂, F₃ISn₂, InNa₂, K₂O₆Si₂Zn, Na₂Tl, NbSe₂, O₁₃P₄Y₂, O₂Si, O₇TaY₃,</p>
21	O ₈ U ₃ ,
25	<p>Ag₃Sb, AsGa, Bi₄Br₂O₉Te₂, CB₂N, C₂BN, CaMoO₆Sr₂, CaO₆Sr₂W, Ca₂O₆PdW, CdO₆Sr₂W, CdTe, HfNO₃Ta, InSb, SiTi,</p>
26	<p>AgNbO₃, B₂K₃Nb₃O₁₂, BaCdK₂Sb₂, BaHgS₂, Br₄CsLi₃, CaF₂, CaNO₂Ta, CaPpT, CdK₂Sb₂Sr, CdO₃Ti, Cl₂O₂W, F₁₃RbTh₃, F₁₃Th₃Tl, Ge₃NaP₃, In₁₁Mo₄₀O₆₂, KPSe₆Zr, MoPt₂Si₃, NaNbO₃, Na₂O₅SiTi, O₂Se, O₃Pb₂, P₅Tl,</p>

Part 4 of all the predicted materials with band crossings from **Cases 1 or 2**:

26	Pb ₃ Si ₂ Sn ₃ Y ₂ ,
29	AgIO ₃ , BNa ₅ O ₁₆ S ₄ , B ₃ BiO ₆ , B ₇ ClMg ₃ O ₁₃ , Ba ₂ N ₅ O ₁₀ Tl, BiIO ₄ , Bi ₂ FNbO ₅ , Bi ₂ MoO ₆ , C ₂ Cl ₂ Hg ₃ N ₄ , C ₂ FNOS, CaO ₃ Te, CdI ₂ O ₆ , CdN ₂ O ₆ , Cl ₁₁ Mo ₃ N ₂ , ClFO ₂ S, Cs ₄ GeP ₄ Se ₁₂ , Cs ₄ Si ₁₁ Ta ₂ , F ₁₆ PdXe ₂ , F ₂ IKO ₂ , F ₂ OSe, F ₄ RbTl, F ₄ SW, GaLaOSe ₂ , GeKNO, GeP ₄ Rb ₄ Se ₁₂ , GePtS, GePtSe, Ge ₄ LiNaO ₉ , Ge ₄ Li ₂ O ₉ , Ge ₄ Se ₉ , HgN ₆ , InNbO ₈ Te ₂ , KPSe ₆ , K ₂ MgO ₄ Si, K ₂ O ₄ SiZn, K ₄ Nb ₂ Si ₁₁ , LiNOSi, Mg ₂ O ₆ Si ₂ , NaNbO ₃ , O ₂ Zr, O ₅ TeU, P ₆ Rb ₄ Se ₁₂ ,
31	AgCd ₂ GaS ₄ , Ag ₂ CdGeS ₄ , Ag ₂ HgSe ₄ Sn, Ag ₂ L ₄ Zn, Ag ₃ AsS ₄ , Ag ₃ PS ₄ , Ag ₃ PSe ₄ , Al ₄ BaS ₇ , As ₄ K ₇ Nb, As ₄ NbRb ₇ , BBaClF ₄ , B ₃ Be ₂ KO ₇ , B ₃ Be ₂ O ₇ Rb, B ₄ CaO ₇ , B ₄ HgO ₇ , B ₄ O ₇ Sn, BaBe ₂ O ₇ Si ₂ , BaGa ₄ S ₇ , Ba ₂ N ₈ Si ₅ , BrIn ₅ S ₅ , BrIn ₅ Se ₅ , CGaNSi, CLi ₄ O ₄ , C ₆ Cs ₃ N ₆ NaRe ₆ Se ₈ , CaCl ₂ , CdGeLi ₂ O ₄ , CdGeLi ₂ S ₄ , CdLi ₂ S ₄ Sn, CdO ₄ S, Cd ₃ Na ₆ O ₁₈ Si ₆ , Ge ₁₆ K ₁₄ Zn, Ge ₁₆ Rb ₁₄ Zn, HfNO ₃ Ta, HgO ₄ S, I ₂ Zr, I ₄ Te, K ₁₀ MgMo ₇ O ₂₇ , MoNNa ₃ O ₃ , N ₈ Si ₅ Sr ₂ , NaNbO ₃ , OSn, O ₇ STe ₂ , S ₃ Sb ₂ , Te ₂ W,
33	AgAsS, AlF ₆ Li ₃ , AlGeLi ₃ O ₅ , AlLi ₄ O ₄ Si, AlO ₄ RbSi, AlO ₄ SiTl, Al ₂ Rb ₄ S ₅ , AsBeCsO ₄ , AsK ₃ S ₄ , AsLiMoO ₆ , AsLi ₃ S ₃ , AuSbTl, Ba ₂ Ge ₂ Te ₅ , BeF ₄ Na ₂ , BeN ₂ Si, BiCl ₃ , Bi ₂ O ₇ Ti ₂ , BrNZn ₂ , C ₁₅ N ₃ O ₁₂ Re ₃ , CBr ₂ Se ₄ , C ₄ N ₄ PbS ₄ Zn, CaF ₂₂ P ₂ Xe ₅ , CaGa ₂ O ₄ , Ca ₂ Nb ₂ O ₇ , CdNaO ₄ P, CdP ₂ , Cl ₁₀ Re ₆ Te ₈ , ClF ₁₁ Sb ₂ Xe, Cl ₄ GaHg ₂ Sb, Cl ₄ Rb ₂ Zn, Cl ₇ Ga ₂ In, Cl ₇ Ga ₂ K, Cl ₇ Ga ₃ , CsIMoO ₆ , CsO ₇ SbSi ₂ , F ₂ O ₄ RbSSb, F ₅ KNaNbO, F ₅ K ₂ Y, F ₆ KNaSn, F ₆ N ₃ P ₃ , GaGeLi ₃ O ₅ , GaLiS ₂ , GaLiSe ₂ , GaNaO ₂ , GeKNaO ₃ , GeKO ₅ P, GeO ₅ RbSb, Ge ₂ Na ₂ Se ₅ , Hg ₂ O ₅ Te, Hg ₅ I ₆ Sb ₂ , ILiO ₃ , INaO ₃ , ISSb, InLiS ₂ , InLiSe ₂ , KLiO ₄ S, KO ₅ SbSi, LaLuS ₃ , LaO ₃ Y, LaS ₂ , La ₂ O ₇ Ti ₂ , LiP ₅ , Li ₂ S, MgN ₂ Si, MgNa ₂ O ₄ Si, Mg ₂ O ₆ Si ₂ , Mo ₃ O ₁₆ Tl ₂ U ₂ , N ₂ SiZn, NaNbO ₃ , NaO ₃ Ta, NaO ₄ SiY, NaO ₆ Se ₂ Y, Na ₂ O ₃ S ₂ , Na ₄ O ₁₃ Sc ₂ Si ₄ , NbO ₄ Sb, O ₂ Sb, O ₂ Si, O ₄ SbTa, O ₄ Sb ₂ , PS ₄ SnTl, P ₄ Se ₅ , S ₃ ScY, S ₃ Sc ₂ , S ₃ Sr ₂ Zn,
36	Ag ₁₀ Br ₃ Te ₄ , AgS ₃ Ta, Ag ₂ GeS ₃ , Ag ₂ HgI ₂ S, Ag ₅ S ₄ Sb, AlBaN ₅ O ₃ Si ₄ , Al ₂ BaN ₄ O ₄ Si ₃ , Al ₆ Ca ₅ O ₁₄ , AsBiCa ₂ O ₆ , AsBiCd ₂ O ₆ , AsCs ₂ LiO ₄ , AsLiO ₄ Rb ₂ , As ₂ Ca ₂ Cd, As ₂ Cl ₁₃ Sb, Au ₂ Ga, Au ₂ O ₁₀ Se ₃ , B ₂ O ₃ , BaBi ₂ Nb ₂ O ₉ , BaF ₄ Mg, BaF ₄ Zn, BaMo ₂ O ₁₁ Se ₂ , BaO ₄ W, BaO ₇ Si ₂ Zn ₂ , BaP ₁₀ , Ba ₂ BiInS ₅ , Ba ₂ GaTe ₅ Y, Ba ₂ InSbSe ₅ , Ba ₂ InSe ₅ Y, Ba ₂ InTe ₅ Y, Ba ₄ Sb ₂ Se ₁₁ Si, BiPbPd ₂ , BiPd, Bi ₂ CaO ₉ Ta ₂ , Bi ₂ GeO ₅ , Bi ₂ Nb ₂ O ₉ Pb, Bi ₂ O ₅ Si, Bi ₂ O ₉ SrTa ₂ , BrCl, BrF ₅ , BrI, C, CaAl ₄ O ₄ , CClF ₃ , CLi ₄ O ₄ , C ₃ Al ₇ N ₃ , Ca ₃ O ₇ Ti ₂ , ClIn, ClN ₃ , Cs ₂ Li, Cs ₂ F ₃ Li, Cs ₂ I ₃ Li, Cs ₂ O ₃ Pb, Cs ₂ S ₂ Te, Cs ₂ S ₃ , Cs ₂ S ₃ Ti, Cs ₂ Se ₃ , Cs ₂ Te ₃ , F ₂ NP, F ₃ K ₃ O ₄ Ti, F ₄ MgSr, GaInS ₃ , GaO ₆ Y ₃ , GaS ₆ Y ₃ , Ga ₂ GeLa ₂ S ₈ , GeLi ₂ O ₃ , GeNa ₂ O ₃ , GeTe ₄ Zr, Ge ₂ LiN ₃ , Ge ₂ N ₂ O, Ge ₂ N ₃ Na, Ge ₆ La ₄ Mg ₅ , Ge ₆ Lu ₄ Zn ₅ , Ge ₆ Y ₄ Zn ₅ , Hg ₂ O ₃ Se, I ₂ O ₇ Ti, I ₄ Nb, In ₂ Na ₅ Te ₆ , K ₂ O ₃ Pb, K ₂ S ₃ , K ₂ Se ₃ , K ₃ S ₄ Sb, LaO ₄ Ta, LiN ₃ Si ₂ , Li ₂ NO ₂ P, Li ₂ O ₃ Si, Li ₂ O ₈ Sn ₃ Zn, Mg ₂ N ₃ P, Mg ₂ O ₄ Si, MoP ₂ , NNa ₅ O ₄ W, N ₂ OSi ₂ , N ₃ NaSi ₂ , N ₃ PZn ₂ , Na ₂ O ₃ Si, Na ₂ O ₇ W ₂ , Na ₂ PdS ₂ , Na ₂ PdSe ₂ , Na ₂ PtS ₂ , Na ₂ PtSe ₂ , NbS ₂ , Nb ₂ O ₇ Sr ₂ , OSn, O ₃ PbRb ₂ , O ₅ Pb ₃ Se, O ₇ Sr ₂ Ta ₂ , PSi, P ₂ W, PbS, Pd ₂ Sb, Rb ₂ S ₃ , Rb ₂ Se ₃ , Sc ₉ Te ₂ ,
38	La ₄ O ₄ Se ₃ , O ₈ U ₃ , Re ₂ ScSi ₃ , Re ₈ Sc ₅ Si ₁₂ ,
40	Br ₃ Cl ₉ Cs ₃ Re ₃ , Cl ₁₂ Cs ₃ Re ₃ , Cl ₄ CsRe,

Part 5 of all the predicted materials with band crossings from **Cases 1 or 2**:

43	AgN ₂ NaO ₄ , Ag ₂ O ₃ , AlNaP ₂ S ₆ , Al ₂ Mo ₅ , As ₃ PbS ₆ Tl, As ₄ Sr ₃ , Au ₂ O ₃ , BaBr ₂ O ₆ , BaCdSe ₄ Sn, BaCl ₂ O ₆ , BaF ₆ Te, Ba ₃ P ₄ , CCl ₂ F ₂ , Ca ₂ GePd ₂ , Cd ₇ P ₁₀ , Cl ₁₂ HfSe ₂ , Cl ₁₂ MoSe ₂ , Cl ₁₂ Se ₂ Zr, Cl ₂ O ₂ S, Cl ₂ O ₆ Pb, Cl ₂ O ₆ Sr, Cl ₂ S ₂ , Cs ₂ Se, F ₄ Pd, F ₄ Pt, Ga ₂ GeLi ₂ S ₆ , Ga ₂ GeS ₆ Sn, GeS ₂ , GeSe ₂ , HfP ₂ S ₆ , I ₄ Si ₁₆ Sn, InSr, N ₆ O ₁₄ Zn, Na ₂ O ₆ Si ₂ Zn, O ₂ Si, O ₅ P ₂ , P ₂ S ₆ Ti, P ₄ Sr ₃ , PdS ₄ U ₂ ,
44	AgNO ₂ , Ag ₈ S, AlF ₇ MgNa ₂ , Al ₂ As ₂ Cs ₂ O ₇ , AsGa, AuCaSn, AuGeNa, BBeLi, BN, BaCaGa ₄ O ₈ , BaN ₈ OSi ₆ , BaN ₈ Si ₆ , Ba ₃ Se ₇ Th, Ba ₅ In ₄ S ₇ Te ₄ , CO ₅ U, Cl ₅ Cs ₂ Li ₃ , GeLuPd, GePdY, GePtU, HgO, NNaO ₂ , N ₅ P ₃ , N ₈ Si ₆ Sr, NaPd ₃ Si ₂ ,
46	AlF ₇ MgNa ₂ , Ba ₂ GaInO ₅ , Ba ₂ In ₂ O ₅ , Ca ₂ Ga ₂ O ₅ , Cd ₂ Nb ₂ O ₇ , Cl ₉ PSe, GaO ₅ ScSr ₂ , In ₂ O ₅ Sr ₂ , NbReSi, Re-SiTa,
48	O ₂ Si,
49	O ₅ Ta ₂ ,
50	C, O ₂ Si,
51	AgBrHgS, AgHgIS, AlPt ₂ , As ₂ Br ₂ Cd ₂ Hg ₂ , AuCsTe, AuTe ₂ , AuRbTe, Au ₃ Rb ₂ Tl, BLi, BaNb ₂ O ₆ , BiPd ₃ , Br ₁₁ CsNb ₄ , Br ₁₁ Nb ₄ Rb, Br ₆ CaTh, Br ₆ SrTh, CB ₂ U, C ₃ AlY ₃ , C ₃ I ₆ OY ₇ , Ca ₅ P ₆ Pd ₆ , CdMg, Cl ₁₁ CsNb ₄ , Cl ₁₁ Nb ₄ Rb, Cl ₁₉ LiNb ₆ , Cl ₂ Mg, GaPt ₂ , K ₂ S, La ₂ Se ₉ U ₂ , MoPt, O ₅ U ₂ , PdTi, PtTi,
52	Ag ₄ Bi ₂ O ₅ , Ag ₆ BaO ₄ , Ag ₆ O ₄ Sr, Al ₂ Ba ₃ N ₄ , Al ₂ N ₄ Sr ₃ , AsGeSe, As ₄ Ga ₃ K ₃ , BaCl ₄ Zn, Ba ₃ Ga ₂ N ₄ , Ba ₃ GeMgN ₄ , BiNbO ₄ , BiO ₄ Ta, Bi ₃ BrO ₄ , Br ₄ Ga ₂ , Br ₄ InK, Br ₄ In ₂ , Br ₄ KTL, Br ₄ Tl ₂ , Ca ₂ GeIn ₂ Sr, Cl ₄ Ga ₂ , FO ₃ ScTe, F ₇ HfKpd, F ₇ KPdZr, Ga ₂ N ₄ Sr ₃ , GeMgN ₄ Sr ₃ , Hf ₂ K ₂ O ₅ , I ₄ In ₂ , K ₂ O ₅ Zr ₂ , LiO ₃ Sb, NbO ₄ Sb, O ₄ SnW,
53	AgISe ₃ , AgITe ₃ , F ₇ KSnZr,
54	AgClO ₂ , Au ₂ Cd ₂ Rb ₂ S ₄ , BiGaO ₃ , ClF ₈ Nb, ClF ₈ Ta, O ₂ Si,
55	AgAsHg ₂ O ₄ , AgK ₅ N ₂ O ₆ , AlGeO ₅ Y, Al ₂ Bi ₆ Ca ₅ , Al ₂ Ca ₅ Sb ₆ , Al ₄ Bi ₂ O ₉ , Al ₅ NaO ₁₂ Ti ₂ , AsKS ₅ Sn, As ₂ F ₁₆ MgXe ₂ , As ₂ Ge, As ₂ O ₆ Zn ₃ , As ₂ Si, As ₃ Ca ₄ , As ₃ Sr ₄ , As ₆ Ca ₅ Ga ₂ , As ₆ Ca ₅ Sn ₂ , As ₆ Sn ₂ Sr ₅ , Au ₂ K ₅ O ₂ , Au ₃ O ₂ Rb ₅ , BTa ₄ Te ₈ , B ₄ MoU, B ₄ MoY, B ₄ UW, B ₄ WY, B ₆ ReSc ₂ , B ₆ ReY ₂ , B ₆ U ₂ W, BaNb ₈ O ₁₄ , Ba ₃ OSb ₂ , Ba ₅ In ₂ Sb ₆ , Bi ₂ Ga ₄ O ₉ , Bi ₆ In ₂ Sr ₅ , Bi ₈ Ca ₃ Pd ₄ , Br ₅ Nb, CB ₂ Lu, C ₂ B ₂ Sc, C ₅ Y ₄ , CaGe ₂ O ₅ , Ca ₂ O ₄ Pb, Ca ₃ O ₆ Tl ₂ , Ca ₅ Ga ₂ Sb ₆ , Ca ₅ In ₂ Sb ₆ , CdCl ₄ Na ₂ , CdO ₄ U, Cd ₂ I ₇ Tl ₃ , Cd ₂ O ₄ Sn, Cd ₇ Th ₆ , Cl ₄ MgNa ₂ , Cl ₄ Na ₂ Ti, Cs ₂ Te ₂ , Ga ₂ Mg, Ga ₅ NaO ₁₂ Ti ₂ , HfO ₃ Pb, HfReSi ₂ , I ₆ PbTl ₄ , InLa ₂ Si ₂ , In ₂ Sb ₆ Sr ₅ , In ₃ NaS ₅ , La ₂ S ₅ Sn, Li ₇ Si ₂ , Mg ₂ O ₄ Si, Na ₂ O ₄ U, Nb ₂ Pd ₃ Se ₈ , Nb ₄ SiTe ₄ , Nb ₈ O ₁₄ Sr, O ₂ Se, O ₃ PbZr, O ₄ Pb ₂ Pt, O ₄ Pb ₃ , O ₆ Sr ₃ Tl ₂ , O ₈ W ₃ , P ₆ Sn ₂ Sr ₅ , Pb ₄ S ₁₁ Sb ₄ , PdSe ₂ Tl ₂ , Pd ₃ Se ₈ Ta ₂ , Pt ₃ S ₈ Ta ₂ , Pt ₃ Sc ₂ Si ₂ , Pt ₃ Se ₈ Ta ₂ , Pt ₇ Sc ₄ Si ₂ , Pt ₇ Zn ₁₂ , Rb ₂ Te ₂ , ReSi ₂ Zr, Se ₂ Ti ₉ , Se ₉ Sn ₂ Sr ₄ , SiTa ₄ Te ₄ ,
56	BiLiO ₃ , Bi ₂ O ₃ , Cl ₆ Se ₄ Zr, I ₁₁ Nb ₆ , Li ₂ O ₅ Te ₂ , Na ₂ O ₄ U, O ₂ Si, O ₃ Sb ₂ , O ₄ SnSr ₂ ,
57	AgNbO ₃ , AlLu, AsCa ₂ ClO ₄ , AsKO ₂ , AsNa ₅ O ₅ , AsO ₂ Rb, As ₂ Cl ₃ Hg ₃ Tl, AuCs ₂ PS ₄ , AuLaO ₃ , AuRb ₂ S ₄ Sb, BaF ₄ OTi, BaF ₅ Sb, Bi ₃ F ₆ N, Br ₃ Hg ₃ Sb ₂ Tl, Br ₅ P, CaNb ₂ O ₄ , Ca ₃ Ga ₂ Pd ₂ , Ca ₃ Ga ₂ Pt ₂ , Cl ₆ HfTe ₆ , Cl ₆ Te ₆ Zr, Cl ₇ Re ₃ Se ₇ , CsP ₇ , Cs ₂ Te ₁₃ , F ₅ KTe, F ₅ SbSr, F ₉ SbSn ₃ , GaLaOS ₂ , HgK ₂ S ₂ , La ₂ O ₂ S ₂ , Li ₂ O ₇ Si ₃ , N ₅ NbSr ₅ , NaNbO ₃ , NaO ₄ TiY,

Part 6 of all the predicted materials with band crossings from **Cases 1 or 2**:

57	OPb, O ₅ TeU, STa ₂ ,
58	Ag ₅ O ₄ Si, Al ₂ O ₅ Si, AsTa ₂ , As ₂ Ti, As ₄ Ca ₃ In ₂ , AuKNa ₂ O ₂ , AuNa ₂ O ₂ Rb, Au ₈ Sn ₃ Sr ₃ , B, B ₂₈ , B ₂ CaLi ₄ O ₆ , B ₂ Cd ₃ O ₆ , B ₂ Mg ₃ O ₆ , Bi ₂ Hf, Bi ₂ O ₂ S, Bi ₂ Zr, Bi ₃ RbS ₅ , Br ₁₆ Ti ₇ , Br ₂ Ca, CO ₂ , C ₂ B ₂ Mg, C ₃ Al ₂ Th ₂ , C ₃ Mg ₂ , CaCl ₂ , Ca ₂ Ge ₃ Li, Ca ₂ LiSi ₃ , Cl ₁₆ Ti ₇ , ClGaTe, Cl ₂ Pd, Cl ₂ Pt, Cl ₅ NaSn ₂ , Cl ₅ Nb ₃ O ₂ , F ₁₂ GeS ₂ , F ₂ Mg, F ₄ Mg ₁₀ O ₁₄ Si ₃ , GaLi ₃ Na ₂ O ₄ , GeO ₂ , Ge ₆ Li ₂ Sr ₄ , HfSb ₂ , I ₂ Li ₅ S ₃ Sb, I ₂ Pd, InK ₂ Na ₃ O ₄ , InNa ₃ O ₄ Rb ₂ , InS, In ₂ P ₄ Sr ₃ , In ₂ Se, In ₂ Te, In ₄ Se ₃ , In ₄ Te ₃ , K ₂ Na ₃ O ₄ Tl, La ₂ Mo ₂ O ₇ , La ₃ LuSe ₆ , Li ₃ N ₄ NbSr ₂ , Li ₃ N ₄ Sr ₂ Ta, N ₂ Pd, N ₂ Pt, O ₂ Pt, O ₂ Sn, P ₉ Zr ₁₄ , S ₁₂ , STi ₂ , SZr ₂ , S ₂ Ti, Sb ₂ Zr, SeTi ₂ , SeZr ₂ ,
59	Ag ₃ Sb, AlClO, AlF ₄ Rb, AlLi ₅ O ₄ , AsCl ₅ , AsKLi ₂ , AsLiMo ₂ O ₉ , As ₅ K ₆ Sn ₃ , AuCs ₃ Ge ₄ , AuCs ₃ Pb ₄ , AuCs ₃ Sn ₄ , AuGe ₄ K ₃ , AuGe ₄ Rb ₃ , AuK ₃ Sn ₄ , AuPb ₄ Rb ₃ , AuRb ₃ Sn ₄ , Au ₂₁ K ₁₂ Sn ₄ , Au ₃ In, Au ₃ In ₃ Sr, Au ₃ KSn ₃ , Au ₃ Lu, Au ₄ S ₃ Tl ₂ , BCsNa ₂ O ₃ , BKNa ₂ O ₃ , BNa ₂ O ₃ Rb, BaLi ₂ Si, BaO ₉ Ti ₄ , Ba ₅ In ₄ Sb ₆ , Ba ₆ Ge ₅ N ₂ , BrHfN, BrInO, BrLuS, BrNTi, BrNZr, BrOSc, Br ₃ Mo, CAgNO, CBiCaFO ₄ , CBrN, CCaO ₃ , CClN, CO ₅ U, C ₂ B ₂ Be, CdS, ClInO, ClNTi, Cl ₇ Mo ₂ O ₂ Tl, CsIn ₇ S ₉ , FNTi, F ₃ La, F ₄ KSb, GeNa ₂ O ₅ Ti, Ge ₅ N ₂ Sr ₆ , Hg ₃ Pd ₈ Se ₉ , INTi, INZr, I ₃ Ti, I ₃ Zr, InNa ₅ O ₄ , InSb, Li ₅ N ₄ Re, NaNbO ₃ , NaNb ₃ O ₈ , Pb ₂ Pd ₃ Te ₂ , PdSiY,
60	Ag ₃ S ₂ Tl, AlCl ₄ Hg ₂ Sb, AlO ₄ Ta, Al ₂ Ca ₂ O ₉ Sn ₂ , Al ₂ O ₃ , As ₁₁ K ₃ , As ₁₁ Rb ₃ , AsKO ₃ , Au ₂ F ₁₂ Hg, Au ₂ Pb, BaCl ₄ Pd, BaCl ₄ Zn, BaN ₂ O ₂ Si ₂ , Ba ₈ Si ₆ Sn, Bi ₂ CdGeO ₆ , Bi ₂ O ₃ , BrHg ₂ P ₃ , CW ₂ , CaCl ₂ , CaNb ₂ O ₆ , CaO ₄ Te, Ca ₃ N ₂ , CdK ₂ O ₂ , CdO ₂ Rb ₂ , Cl ₃ CsLi ₂ , Cl ₄ LuNa, Cl ₄ NaSc, F ₂ Zn, F ₄ InLi, F ₄ Na ₂ O ₂ W, F ₆ NaRbSn, GeO ₂ , Hg ₃ Rb ₂ Te ₄ , I ₂ O ₆ Pb, In ₂ O ₃ , KMo ₂ O ₈ Y, K ₃ P ₁₁ , LiO ₆ SbW, Li ₂ O ₅ Si ₂ , MgNb ₂ O ₆ , MgO ₃ Si, MgO ₅ Te ₂ , Mg ₂ O ₆ Si ₂ , N ₄ S ₄ , Na ₂ O ₂ Pb, Na ₂ O ₄ Te, Na ₂ O ₅ Si ₂ , Na ₂ O ₉ Si ₂ Ti ₂ , Na ₂ Te ₂ , Na ₃ P ₁₁ , Nb ₂ O ₆ Zn, O ₂ Pb, O ₂ Sn, O ₂ Ti, O ₃ W, O ₄ SrTe, O ₅ Se ₂ Zn, O ₆ Ta ₂ Zn, P ₁₁ Rb ₃ , PPdS, PPdSe, S ₅ Th ₂ , Se ₅ Th ₂ ,
61	AgIO ₃ , Al ₂ Cl ₈ Te ₄ , AsCd, AsCsSe ₂ , AsNaO ₂ , AsNaSe ₂ , AsS ₃ Tl ₃ , AsZn, As ₃ LaSi, AuSn ₂ , Au ₃ Ca ₇ , B ₂ Cl ₄ , Ba ₂ In ₂ Se ₅ , Ba ₂ Nb ₂ O ₁₀ Te, Bi ₂ MoO ₆ , Bi ₂ Pt, Br ₅ PdTi ₃ , Br ₈ Cs ₂ Re ₂ , C ₂ N ₂ , C ₂ N ₂ S, CaN ₂ Si, Ca ₄ O ₁₀ Ti ₃ , CdSb, ClF ₃ KSb, ClO ₂ , Cl ₂ PdSe ₈ , Cl ₄ Hg ₃ Te, FOSb, GaNaO ₂ , Ga ₂ O ₅ Sr ₂ , GeLaSe ₄ Tl, HfO ₂ , HfRb ₂ S ₄ , HgNa ₂ S ₂ , HgO ₂ , Hg ₃ Na ₂ S ₄ , I ₂ O ₆ Pd, I ₂ Sr, I ₄ Pt, K ₂ S ₄ Zr, LaO ₄ Ta, Lu ₂ O ₄ Pd, Na ₂ O ₄ U, O ₂ Sn, O ₂ Te, O ₂ Ti, O ₂ U, O ₃ SeZn, O ₃ TeZn, P ₄ Re, PdS ₂ , PdSe ₂ , PtSbSi, PtSiTe, Re ₂ Te ₅ , Re ₆ Se ₈ Te ₇ , Re ₆ Te ₁₅ , S ₉ Sb ₂ Sn ₅ , SbZn,
62	AgBr ₃ Cs ₂ , AgBr ₃ Rb ₂ , AgCaSb, AgClO ₄ , AgCl ₃ Cs ₂ , AgCl ₃ Rb ₂ , AgCs ₂ I ₃ , AgI ₃ K ₂ , AgI ₃ Rb ₂ , AgSTl, AgSeTl, AgTe, AgTeTl, Ag ₂ BaTe ₂ , Ag ₂ CsI ₃ , Ag ₃ AsSe ₃ , AlAs ₃ Ca ₃ , AlAuCa, AlBMgO ₄ , AlBr ₄ Cs, AlCa ₂ F ₇ , AlCa ₃ Sb ₃ , AlCdF ₆ Na, AlCl ₄ Cs, AlCl ₄ In, AlCl ₄ Tl, AlCsF ₆ Pd, AlF ₄ K, AlF ₆ PdRb, AlI ₄ Na, AlKSb ₄ , Al-LaPt, AlLuPt, AlO ₃ Sc, AlO ₃ Y, AlP ₃ Si, AlPdY, AlPtY, Al ₂ As ₄ Ba ₃ , Al ₂ BaGe ₂ , Al ₂ BaSi ₂ , Al ₂ Ba ₃ P ₄ , Al ₂ BeO ₄ , Al ₂ CaO ₄ , Al ₂ Ca ₃ Ge ₃ , Al ₂ F ₂ GeO ₄ , Al ₂ F ₂ O ₄ Si, Al ₂ MgO ₄ , Al ₂ O ₅ Si, Al ₂ Sb ₆ Sr ₅ , Al ₃ ITe ₃ , AsBaKO ₄ , AsBa ₂ GaSe ₅ , AsCaLi, AsCaNaO ₄ ,

Part 7 of all the predicted materials with band crossings from **Cases 1 or 2**:

62	<p>AsCaPd, AsCa₃N, AsCdNa, AsCd₃Cl₃, AsCs₃Se₄, AsKMoO₆, AsK₃Se₄, AsLaTe, AsLiMgO₄, AsLiO₅Ti, AsLiSr, AsRb₃Se₄, AsS₄Tl₃, AsSe₄Tl₃, As₂BaZn₂, As₂CsSe₃, As₂Hf, As₂Hf₃, As₂K₄Te₄, As₂O₄, As₂Th, As₂Zr, As₃Ba₃In, As₃Ca₃Ga, As₃ClO₆Pb₂, As₃Cs₅Ge, As₃GeKNa₄, As₃Hf₅, As₃K₅Pb₃, As₃LaZn₃, As₃Nb₅, As₃OSr₃Ta, As₃Rb₅Si, As₃Sc₅, As₄Cd₂Ge, As₄K₆NbTl, As₄S₃, As₄Se₃, As₅Ba₂In₅, AuLa, BaLa₂O₄, BaLu₂O₄, BaLu₂S₄, BaLu₂Se₄, BaLu₂Te₄, BaO₃Th, BaS₃U, BaSe₅U₂, Ba₂Pb, Ba₂S₃Zn, Ba₂S₄Ti, Ba₂Sb₆Sn₃, Ba₂Si, Ba₂Si₄, Ba₂Sn, Ba₂SnTe₅, Ba₃BrGaS₄, Ba₃ClGaS₄, Ba₃ClGaSe₄, Ba₃GaSb₃, Ba₃GeO, Ba₃GeS₅, Ba₃S₅Si, Ba₅P₄, Ba₅Sb₄, Ba₇Ge₆, BeCl₄Cs₂, BeCs₂F₄, BeF₄K₂, BeF₄Na₂, BeF₄Tl₂, BeO₄Y₂, BiBrCdSe₂, BiBrS, BiBrSe, BiBr₆Rb₃, BiCaLi, BiCdClS₂, BiClS, BiClSe, BiCl₃O₃Sr₃, BiF₃, BiF₅K₂, BiIn₂Se₄, BiIS, BiISe, BiI₃, BiInO₃, BiLiSr, BiMg₂O₆P, BiO₆PPb₂, Bi₂CdCs₂S₅, Bi₂Cs₂S₅Zn, Bi₂Cs₂Se₅Zn, Bi₂Ga₄O₉, Bi₂GeO₅, Bi₂O₅Sr₂, Bi₂PbS₄, Bi₂Pb₂S₅, Bi₂S₃, Bi₂S₅Tl₄, Bi₂Se₃, Bi₃CsS₅, Bi₃CsSe₅, Bi₃In₂Se₇, Bi₃Sc₅, Bi₃Y₅, Bi₆Cl₃FO₇, BrClPb, BrCsI₂, BrIPb, BrKO₄, BrLa₂S₅Sb, BrLa₃Te₄, BrO₄Tl, BrSSb, BrTe₂, Br₂O₂Pb₃, Br₂Pb, Br₂S₇Te, Br₂Sn, Br₂Sr, Br₃CdIn, Br₃CdRb, Br₃CdTi, Br₃Cs, Br₃CsPb, Br₃InMg, Br₃P, Br₃Sb, Br₄CdCs₂, Br₄CsGa, Br₄Cs₂Zn, Br₄GaNa, Br₄Rb₂Zn, Br₅Cs₃Hg, Br₅Nb, Br₅Rb₃Zn, Br₇P, C, CLiN, CO₃Pb, C₂Ba, C₃O₂, Ca, CaCdPd, CaCdPt, CaCd₂Pd, CaCl₂, CaF₂, CaF₃K, CaGa₂O₄, CaGeMg, CaGeMgO₄, CaGeO₃, CaGePt, CaGeSr, CaHfS₃, CaLiN, CaLiSb, CaMgO₄Si, CaMgPd, CaMgSi, CaMgSn, CaMoO₃, CaO₃Pb, CaO₃Si, CaO₃Sn, CaO₃Ti, CaO₃Zr, CaO₄S, CaO₄Sc₂, CaO₆Ta₂, CaPbPd, CaPbPt, CaPbSr, CaPdSn, CaPtSi, CaPtSn, CaS₃Zr, CaS₄Sc₂, CaS₄Y₂, CaSe₅U₂, CaSiSr, CaSnSr, CaTe, Ca₂CdSb₂, Ca₂Cd₂KSb₃, Ca₂Ge, Ca₂GeS₄, Ca₂Ge₂InLi, Ca₂Hg, Ca₂O₄Si, Ca₂Pb, Ca₂Pt₃Sn₅, Ca₂S₄Si, Ca₂S₄Sn, Ca₂Se₄Si, Ca₂Si, Ca₃GeO, Ca₃Hg, Ca₃InP₃, Ca₃OSi, Ca₃Pd, Ca₆Cd₁₁Pt, Ca₇Ge₆, CdClS₂Sb, CdCl₃K, CdCl₃Rb, CdCl₃Tl, CdCs₂I₄, CdCs₃I₅, CdF₂, CdF₃K, CdGeO₃, CdGeSr, CdI₃Tl, CdLi₂O₄Si, CdNaSb, CdO₃Se, CdO₃Sn, CdO₃Ti, CdP₁₄Pb, CdP₁₄Sn, CdPtSr, CdSbTl, Cd₂GeO₄, Cd₂KSb₃Sr₂, Cd₃K₂S₄, Cd₃K₂Se₄, Cd₃K₂Te₄, Cd₃Na₄Se₅, Cd₃Rb₂S₄, Cd₃Rb₂Se₄, ClCsO₄, ClCs₃O, ClFSn, ClF₃, ClIPb, ClKO₃, ClKO₄, ClK₃O, ClLaNb₂O₆, ClLaSe, ClLaTe, ClLiO₄, ClLuO₃Se, ClN₅S₄, ClNaO₄, ClNb₃O₇, ClO₃SbTe, ClO₄Rb, Cl₂Hg, Cl₂O₂Pb₃, Cl₂O₂U, Cl₂O₃Sb₂Zn, Cl₂Pb, Cl₂S₅Sb₄, Cl₂S₇Te, Cl₂Sn, Cl₃GaLi, Cl₃HgNa, Cl₃HgTl, Cl₃KMg, Cl₃Na, Cl₃P, Cl₃Sb, Cl₄CsGa, Cl₄Cs₂Hg, Cl₄Cs₂Mg, Cl₄Cs₂Zn, Cl₄GaRb, Cl₄GaTl, Cl₄HgK₂, Cl₄K₂Zn, Cl₄Li₂Zn, Cl₄Rb₂Zn, Cl₅CsPd₂, Cl₅Cs₂Tl, Cl₅Cs₃Hg, Cl₅K₂La, Cl₅Mo, Cl₅PbRb₃, Cl₇InY₂, CsF₄IO, CsF₅Te, CsI, CsIO₄, CsI₃, CsI₃Pb, CsI₃Sn, CsIn₃O₅, CsO₆ScSe₂, CsPPbS₄, CsPPbSe₄, Cs₂GaSb₂, Cs₂GeTe₄, Cs₂MoS₄, Cs₂MoSe₄, Cs₂O₃Sn₂, Cs₂O₄Se, Cs₂O₄Te, Cs₂O₄W, Cs₂S, Cs₂S₄W, Cs₂Se, Cs₂Se₄W, Cs₂SnTe₄, Cs₂Te, Cs₃I₅Zn, Cs₃NbSe₄, Cs₃O₄Sb, Cs₃PSe₄, Cs₃S₄Sb, Cs₃S₄Ta, Cs₃SbSe₄, Cs₃Se₄Ta, Cs₄Sb₂, Cs₅GeP₃, Cs₅P₃Si, F₁₀GeXe, F₁₁PtXe, F₁₁SbXe, FLa₃N₄Si, FLiO₄SZn, FMO₃Na₃O₄, FNa₃O₄W, FOSb, FO₃STl, FO₄SY, FSeY, F₂Ge, F₂Hg, F₂Mg, F₂Mg₃O₄Si, F₂O, F₂Pb, F₂S₃SnSr₂, F₂Se₃SnSr₂, F₂Sr, F₃I,</p>
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Part 8 of all the predicted materials with band crossings from **Cases 1 or 2**:

62	<p> F_3MgNa, F_3NaZn, F_3PbRb, F_3Tl, F_3Y, F_4GaK, F_4KTI, F_4LaRb, F_5KPD_2, $F_5Lu_3O_2$, F_5NaTe, F_5RbS, F_5RbTe, F_5TeTl, F_6KNaSi, F_6Mo, F_6Pt, F_6Te, F_6W, $F_7InMgNa_2$, F_7K_2Ta, F_7LiSb_2, F_7NbOSe, F_8Li_4Zr, F_8Pb_2Zr, F_9KU_2, $GaKO_6Se_2$, $GaKSb_4$, GaK_2Sb_2, $GaLaO_3$, GaLaPd, $GaLaPd_2$, GaLaPt, $GaLa_3OS_5$, GaLuPd, GaLuPt, $GaNao_6Se_2$, GaPdSc, GaPdY, $GaPd_2Y$, GaPtSc, GaPtY, $GaRb_2Sb_2$, $GaTh$, $Ga_2K_2Na_4O_6$, $Ga_2MoO_{10}Te_2$, Ga_2Pd_5, Ga_3ITe_3, $Ga_3Na_2Sb_3$, Ga_5Lu_3, Ga_5Y_3, $GeHfMo$, GeHfPt, GeI_3Tl, $GeInLiO_4$, $GeLiNbO_5$, $GeLiO_4Sc$, $GeLi_4S_4$, $GeLuNaO_4$, $GeMgSr$, $GeMg_2O_4$, $GeMg_2S_4$, $GeMg_2Se_4$, GeMoZr, $GeNaO_4Y$, $GeNa_4Se_4$, $GeOSr_3$, GeP_3Rb_5, GePd, GePdTi, $GePdU$, GePdZr, GePt, $GePtU$, GePtZr, GeS, GeS_3Ti, $GeSe$, $GeSr_2$, $GeTe$, $GeTe_3Tl_2$, GeZr, Ge_2InLiSr_2, Ge_2Li_3Na, Ge_2Mo, Ge_2Pt_3, Ge_2Sr, Ge_2W, Ge_3N_4, Ge_3Pt_2, Ge_4Hf_3Nb_2, Ge_4Hf_5, $Ge_4Mo_3Sc_2$, Ge_4Ti_5, Ge_6Sr_7, $HfLa_2S_5$, $HfLa_2Se_5$, $HfMoSi$, HfNbP, HfO_2, HfO_3Sr, HfP_2, $HfPbS_3$, HfPdSi, HfPtSi, HfS_3Sn, HfS_3Sr, HfS_5Y_2, HfSi, HfSiW, Hf_3P_2, HgMg_2, HgO, HgO_3Se, $HgP_{14}Sn$, HgSr_3, Hg_3Sr, Hg_8Sr, IIn_3Te_3, $INZn_2$, $INaO_3$, $INbO_2$, $ISSb$, $ISbSe$, ITe_2, $I_2O_2Pb_3$, $I_2P_4S_3$, $I_2P_4Se_3$, I_2Sr, I_3PbRb, I_3Rb, I_3RbSn, I_3Tl, I_4Li_2Zn, I_5Ta, I_6PdRb_2, $InKO_6Te_2$, $InLaO_3$, $InLiO_4Si$, InP_3Sr_3, InS_3Sb, InS_4SiTl, $In_2KNa_9O_8$, In_2O_3, In_2O_4Sr, In_2O_5Ti, In_2PbS_4, In_4La_2Pd_3, In_5Y_3, K, KNO_3, $KNaS$, $KNaSe$, $KNaTe$, KO_6Se_2Y, KO_6Te_2Y, $KPPbS_4$, $KRbS$, K_2MoS_4, $K_2Na_3P_3Si$, $K_2O_{10}UW_2$, K_2O_3Pb, K_2O_3Sn, K_2O_3Zr, K_2O_4S, K_2O_4Se, $K_2P_2PdS_6$, K_2Se_4W, K_2Te_3, K_3LiSi_4, $K_3Li_3O_6Te$, K_3NO_4, K_3NbS_4, K_3NbSe_4, K_3PS_4, K_3PSe_4, K_3S_4Ta, $K_4Se_2SnTe_2$, K_4Se_4Sn, $LaLuO_3$, LaO_3Sc, LaO_3Y, LaO_9Ta_3, LaPPt, $LaPS$, $LaRbS_4Si$, LaS_2, LaSbTe, $La_2O_2S_3Sn$, La_2O_5Ti, La_2S_3, La_2S_5Th, La_2S_5U, La_2S_5Zr, La_2Se_5Th, La_2Se_5U, La_2Se_5Zr, La_3NS_3, La_3NbO_7, $La_4N_2Te_3$, $Li_{12}Si_7$, $LiMgN$, $LiNaSe$, $LiNaTe$, $LiORb$, LiO_4ScSi, $LiSbSr$, Li_2O_4U, $Li_2O_7S_2$, $Li_2O_7Se_2$, Li_2S, Li_3NaSi_6, Li_4S_4Sn, Li_4Se_4Sn, Lu_2PbS_4, Lu_2S_4Sr, Lu_2S_4Zn, Lu_2Se_4Sr, Lu_5Sb_3, MgO_3Se, MgO_3Si, MgO_4S, MgO_4Se, MgO_6Pb_2W, $MgPbSr$, $MgPd_2$, $MgSiSr$, MgSi_2Sr, $MgSnSr$, Mg_2O_4Si, Mg_2Pb, Mg_2S_4Si, Mg_2S_4Sn, Mg_2Se_4Si, Mg_2Se_4Sn, Mg_2Si, MoO_3, MoO_4Rb_2, MoPt_3Si_4, $MoRb_2S_4$, $MoRb_2Se_4$, $MoSiZr$, $Mo_3Sc_2Si_4$, Mo_4P_3, NNa_3, N_3TaTh, N_4Si_3, N_4Zr_3, N_5Ta_3, Na, $NaNbO_3$, NaO_3Sb, NaO_3Ta, NaO_6ScSe_2, NaP_5, Na_2S, Na_2S_5, Na_3O_2Tl, Na_4Se_4Si, NbPZr, $NbRb_3S_4$, Nb_5P_3, $O_{14}Rb_3Ta_5$, $OSiSr_3$, O_2Pb, O_2Sn, O_2SrZn, O_2Te, O_2Th, O_2Ti, O_2W, O_2Zr, O_3PbRb_2, O_3PbS, O_3PbSr, O_3ScY, O_3SeSr, O_3SeZn, O_3SnSr, O_3SnTl_2, O_3SrZr, O_3Ti_2, O_3W, O_3Y_2, O_4PbS, O_4Rb_2S, O_4Rb_2Se, O_4SSn, O_4SSr, O_4STl_2, O_4SZn, O_4SeTl_2, O_4SiSr_2, O_4SiZn_2, O_4SrTl_2, O_4SrY_2, O_5P_2, O_5STi, O_5TiY_2, O_6RbSe_2Y, O_6RbTe_2Y, $O_7Si_2Y_2$, $P_{14}PbZn$, $PPbRbS_4$, $PPbS_4Tl$, PPtSc, PRb_3S_4, PSY, PS_4SrTl, PS_4Tl_3, PSc_3, PSe_4Tl_3, P_2Th, P_2Ti, P_2Zr, P_3Re, P_3Ta_5, P_4S_3, PbS, PbS_3Sn, PbS_3Zr, PbS_4Sc_2, PbS_5U_2, $PbSc_2Se_4$, $PbSe$, PbSe_5U_2, PbSr_2, $PbTe$, Pb_4Se_4, Pb_4Sr_5, PdSc_6Te_2, $PdSe_3U$, $PdSi$, $PdSiTi$, $PdSiU$, $PdSiZr$, $PdSn$, $PdTe_2Y_6$, $PdTh$, Pd_2Sn, Pd_2SnU, </p>
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Part 9 of all the predicted materials with band crossings from **Cases 1 or 2:**

62	<p>Pd₂Zn, Pd₃Si, Pd₃Ta₂Te₅, Pd₉Si₂, PtSc₂, PtSi, PtSiTi, PtSiZr, PtSnSr, PtY₂, Pt₃Si, Pt₃Sr₇, Pt₄Sr₅, RbSb₃Se₅, Rb₂S, Rb₂S₄W, Rb₂Se₄W, Rb₂Te, Rb₂Te₃, Rb₃S₄Sb, Rb₃S₄Ta, Rb₃SbSe₄, SSeU, SSn, STeU, S₂Th, S₂Ti, S₂U, S₃Sb₂, S₃SnSr, S₃SnZr, S₃Sn₂, S₃SrZr, S₃Sr₂Zn, S₃TaTl, S₃TeTl₂, S₃Th₂, S₃U₂, S₃Y₂, S₄Sc₂Sr, S₄SrY₂, S₄Y₂Zn, S₅Sb₂Sn₂, S₅TiU₂, S₅U₃, S₅Y₂Zr, Sb₂Se₃, Sb₂SrZn, Sb₃Sc₅, Sb₄Sn₃Sr, Sc₂Si₄W₃, Sc₂SrTe₄, Sc₂Te, SeSn, SeTeU, SeTi, SeTi₂, Se₂Th, Se₂U, Se₃SnTl₂, Se₃SrZr, Se₃TaTl, Se₃Th₂, Se₃U₂, Se₄SrY₂, Se₅U₃, SiSr, SiSr₂, SiTh, SiTi, SiU, SiZr, SnSr₂, SnTe, SnTe₃Tl₂, Sn₄Th₅, SrZn, SrZn₅, TeZr, TeZr₂, Te₃U₂, Te₅U, Te₅U₃,</p>
63	<p>Ag₁₀Br₃Te₄, AgAuBa₄O₆, AgBaLaSe₃, AgBaSe₃Y, AgBaTe₃Y, AgBiCl₂S, AgBr₂Cs, AgCl, AgCl₂Cs, AgCsS₃U, AgCsSe₃U, AgCsTe₃U, AgK₂P, AgNa₂Sb, AgNbO₃, AgRbS₃U, AgRbSe₃U, AgS₃Ta, Ag₂Si, Ag₃BrS, AlB-Mo, AlBW, AlCl₈Nb, AlF₃, AlF₄Na, AlF₅Tl₂, AlGeLu, AlGeSc, AlHf₃N, AlLa, AlLuSi, AlN, AlNZr₃, AlSc, AlSiY, AlY, Al₂BaSi₂, Al₂GeLa₂, Al₂MgO₄, Al₂O₅Ti, Al₄Mg₁₉Zn₁₅, AsAuNa₂, AsBiMg₂O₆, AsIn, As₂BaPd, As₂BaPt, As₂Cs₂Pd, As₂K₂Pd, As₂K₂Pt, As₂PtRb₂, As₃Nb₄, As₄Cd₅Rb₂, As₄K₂Zn₅, As₄Rb₂Zn₅, As₆Ba₄Cd₃Li₂, AuBiK₂, AuBiNa₂, AuCa₂N, AuClTe₂, AuCsS, AuCsSe, AuCsSe₃U, AuCsTe₃U, AuIn₂Na, AuKS, AuKSe, AuK₂P, AuK₂Sb, AuLa, AuNSr₂, AuNaO₂, AuNa₂Sb, AuO₂Rb, AuRbS, AuRbSe, AuRbSe, AuRbSe₃U, AuRbTe₃U, AuY, Au₂P₂Pb, Au₃Mg, BF₄Na, BNU, BNB, BO₃Y, BTa, B₂BaGa₂O₇, B₂Li₂S₅, B₄O₇Zn, B₇WY₃, BaBiClO₂, BaBiIO₂, BaCd₂Pt, BaClO₂Sb, BaF₄Mg, BaGe, BaIn, BaIn₂Pt, BaLa₂O₁₀Ti₃, BaOSZn, BaO₆Te₂, BaO₈Si₂U, BaPb, BaPdS₂, BaPdSb₂, BaSi, BaSi₆, BaSn, BaZn₅, Ba₃Cl₂O₅W, Ba₃Ge₅, Ba₃Pb₅, Ba₃Sn₅, Ba₄Cd₃Li₂P₆, Ba₅Cd₂FSb₅, BeHf, BePd₃, BiBrO₂Sr, BiClO₂Pb, BiClO₂Pb, BiClO₂Sr, BiIO₂Sr, BiO₄Re, Bi₂Ca, Bi₂Cs₂Pd, Bi₂Cs₂Pt, BrIn, BrLaO₇Pb₆, BrO₄Y₃, BrTl, Br₂LiRb, Br₂O₁₁Te₆, Br₃CaIn, Br₆Mo₆S₃, CAgNO, CB₃Nb₃, C₂BF₂LiO₄, C₃BLu₃, C₅₆Cl₁₀, C₇₀, CaGe, CaIn₂Pd, CaIn₂Pt, CaIn₄Pd, CaO₃Pt, CaO₄S, CaO₄Ti₂, CaO₄Ti₂, CaO₄Tl₂, CaPdSn₂, CaSi, CaSn, CaZn, Ca₂InN, Ca₂Sn₆Zn₃, Ca₃Zn, CdCsLaTe₃, CdCsLuTe₃, CdCsSe₃Y, CdF₇RbZr, CdF₇TlZr, CdO₄S, CdTe, Cd₂FSb₅Sr₅, Cd₂PdSr, Cl₁₂Rb₃Re₃, ClCsO₂, ClIn, ClKO₂, ClNaO₄, ClO₂PbSb, ClO₂Rb, ClTl, Cl₂LiRb, Cl₂MoO₅Pb₃, Cl₂O₁₁Te₆, Cl₂O₅Pb₃W, Cl₃Cs₂Li, Cl₃F₁₀K₃Sn₅, Cl₄CsLi₃, Cl₄Cs₂Pd, Cl₄Cs₂Pt, CsHgLaSe₃, CsHgSe₃Y, CsLaTe₃Zn, CsNaO₃Ti, CsScSe₅U, CsSe₃YZn, CsTe₃YZn, Cs₂F₄OTe, Cs₂O₃Pb, Cs₂O₃Zr, Cs₂P₂Pt, Cs₂PdSb₂, Cs₂PtSb₂, Cs₂Se₃Zr, Cs₂Te₅, Cs₃NaPb₄, F₁₀Pb₃Zr, F₁₄I₂Pb₈, F₂InaO₂, F₂O₂Xe, F₃ISn₂, F₃MgNa, F₄K₂OTe, F₄MgSr, F₅K₂Sb, F₆K₂Zr, F₆Rb₂U, Ga, Ga₁₃K₃, GaLa, GaLu, GaSc, GaU, GaY, GeLa, GeLi₄O₄, GeMgO₃, GeNa₂Zn, GeS, Ge₂Hf, Ge₂Pt₃, Ge₂Th, Ge₂U, Ge₃La₂Li₂, Ge₄Na₄S₁₀, Ge₄Na₄Se₁₀, Ge₆La₂Zn₃, Ge₈Na₁₅PSn, HfO₃Sr, HfPd, HfPt, HfSi₂, HfTe₅, HgNa, HgNa₂Pb, HgTe, In, IK₄P₂₁, IP₂₁Rb₄, ITl, I₃La, I₃PbTl, InSb, In₂PdSr, In₂PtSr, In₄PbSr₃, In₄PdSr, In₄PtSr, In₅La₃, In₅Y₃, KNb₃O₈,</p>

Part 10 of all the predicted materials with band crossings from **Cases 1** or **2**:

63	<p>K₂O₃Ti, K₂P₂Pd, LaLiSn₂, LaSi, La₂Li₂Si₃, La₂PbZn₅, La₂SnZn₅, La₂Te₅, La₃NbO₇, La₃O₇Sb, La₃O₇Ta, La₃Tl₅, LiLuSn₂, Li₂Nb₂O₇Sr, Li₂O₄S, Li₂O₇SrTa₂, Li₄O₄Pb, Li₄O₄Ti, Lu₃Tl₅, MgO₃Si, MgO₄S, MgO₄Se, Mg₂PdSr, MoNNa₅O₄, Mo₉Se₁₁, NO₂SiY, N₃TaTh, N₅Ta₃, NaNbO₃, NaO₃Ta, Na₂O₄S, Na₂S₅Si₂, Na₂Tl₂, Na₄Si₁₀Si₄, Na₄Se₁₀Si₄, Na₅Sn₁₃, Na₆O₅Pb, O₁₄Si₄Sr₂Ti₂, O₂Te, O₃SrZr, O₄SiTi, O₅Ti₃, O₆Pb₃S, O₇SbY₃, O₇Sn₂Sr₃, O₇Sr₂Ta₂, O₇TaY₃, O₈U₃, PbS, PbSr, Pb₄Se₄, PdSr, PdSrTl₂, PdZr, Pd₃Te₂, Pd₃Ti₂, PtTh, PtU, PtZr, SiZr, Si₂₄, Si₂Ti, Si₂Zr, Si₆Sr, SnSr, SnTi₃, Sn₂Th, Sn₄Sr, Sn₅Sr₃, TeZn, Te₃U, Te₅Zr, TiZn₁₆, Tl₅Y₃, U,</p>
64	<p>AgNO₃, Ag₂Cl₄Pd, Ag₂HfS₃, AlBa₃Sb₃, AlLi, AlLiNa₂P₂, AlSb₃Sr₃, As, AsHg₄I₅, As₂GaK₂Li, As₂GaLiNa₂, As₂InK₂Li, As₃In₂K₃, As₆K₆Na₄Sn₂, Au₃Zn, B₁₂Li₂Si₂, B₂BaSe₆, B₂Br₄Cl₆N₂P₂, BaGe₂O₅, BaN₂Si, BaO₁₄Sr₄U₃, Ba₂Bi₄Cd₃, Ba₂Ca₂Sn₆, Ba₂F₆Pd, Ba₂Ge₄Pd₅, Ba₄O₁₀PtTi₂, Ba₄OP₂, Ba₅P₄, Ba₅Sb₄, Ba₆Ga₂P₆, BiSn, Bi₂MoO₆, Bi₅BrO₇, Br, Br₁₂Mo₆, Br₁₂W₆, Br₁₄Ta₆, Br₁₆W₆, Br₂, CCl₁₄Ti₆, CCl₁₄Zr₆, Cl₁₄Zr₆, CO₂, CS₂, CSe₂, C₂B₂Mg, C₂N₂Se, Ca, CaO₄Se, CaO₄W, Ca₂N₃P, Ca₅Ga₂N₄, Ca₅O₁₄Te₃, CdClIO₃, Cl, Cl₁₂Mo₆, Cl₁₄Nb₆, Cl₁₆Li₂Nb₆, Cl₂, Cs, Cs₃Na₂P₃Sn, Cs₄F₁₀Mg₃, Cs₄F₁₀Zn₃, F₃Na₂O₄SSb, Ga, Ge, GeN₂Sr₂, HgO₄W, I, I₁₄Ta₆, I₂, I₂Mo, InK₂NaSb₂, In₉KNa₃, K, KLiO, KTi, K₂O₂, K₃Na₂P₃Sn, K₄Sn₂Te₆, LaS, La₂O₂S₂, Li, LiTi, Mo₂Na₂O₇, Na₂O₇W₂, Na₄P₂Se₆, NbP₂S₈, O₂Si, O₃Rb₂Ti, O₄PbW, O₄SnSr₂, O₄WZn, O₅Si₂Sr, P, PdSn₃, Pd₈Sn₂₄, Rb, Sn₃Ti₂,</p>
66	<p>Al₂PbS₄, Al₂S₄Sr, Al₂Se₄Sr, BaGa₂Se₄, Baln₂Te₄, Ba₃S₇Zr₂, CaGa₂S₄, Ga₂PbSe₄, Ga₂S₄Sr, Ga₂Se₄Sr, Ga₂SrTe₄, I₃Th, In₂SrTe₄,</p>
67	<p>AgClO₂, AlB₃CaO₇, Al₄O₇Sr, Au₂Cd₂Cs₂S₄, BaF₆Zr, C, ClFOPb₂, Cl₉PSn, F₃La, F₆PaRb, F₆PbZr, OPb,</p>
68	<p>Al₂F₁₆Sr₅, AuNaS, CaCl₂O₄, Cl₂O₄Pb, Cl₂O₄Sr, K₄Se₈Sn₃, O₂Si, Pd₄Sn₁₆, PtSn₄,</p>
70	<p>AgCs₂NbS₄, AgCs₂NbSe₄, AgCs₂S₄Ta, AgK₂NbS₄, AgK₂S₄Ta, AgNbRb₂S₄, AgNbRb₂Se₄, AgRb₂S₄Ta, Ag₂Ba₄Si₆, Ag₂GeK₂Se₄, Ag₂O₄S, Ag₂O₄Se, Al₂CaS₄, Al₂S₄Sr, AsMoO₆Rb, As₂Na₂O₈Th, AuLiS, Au₂BaP₄, Au₂Cs₂S₄Sn, B₂BaBe₂O₆, BaCl₂O₈, Ba₂CaN₄W, Ba₃GeI₂, Ba₃I₂Si, Ba₄Ge₆Li₂, Ba₄Li₂Si₆, Ba₄MgN₆Si₂, BiCa₂Na₃O₆, CaGa₂S₄, Ca₂Na₃O₆Ta, Cd₂O₄Si, CsTi, FInO, Ga₂PbS₄, Ga₂PbSe₄, Ga₂S₄Sr, Ga₄LaNaSe₈, GeHg₂O₄, Ge₂Ti, Ge₆Li₂Sr₄, In₂S₄Sr, In₂Se₄Sr, K₂Pd₃S₄, K₄P₆, Li₂Si₆Sr₄, Lu₂Te₃, MoNa₂O₄, Na₂O₃Pt, Na₂O₄S, Na₂O₄Se, NbSn₂, Nb₂O₁₀TiU, O₂Si, O₃U, P₂S₇U, Pd₃Rb₂S₄, Pd₃Rb₂Se₄, Rb, S₃Sc₂, S₈, SbSnTi, Sc₂Te₃, Se₃Y₂, Si₂Ti, Sn₂Ta, Sn₂Zr, Te₃Y₂,</p>
72	<p>AgN₃, AgNa₃O₂, AgNa₃S₂, AgNb₃O₈, Ag₃LiO₂, Ag₃NaO₂, AlAs₂K₂Na, AlAs₂Na₃, AlK₂LiP₂, AlK₂NaP₂, AlNa₃P₂, As₂Ba₂Zn, As₂Cs₂Si, As₂Cs₂Sn, As₂GaK₂Na, As₂GeK₂, As₂InK₂Na, As₂K₂Si, As₂Rb₂Si, As₂Rb₂Sn, AuKS₅, AuKSe₅,</p>

Part 11 of all the predicted materials with band crossings from **Cases 1** or **2**:

72	AuLi ₃ S ₂ , Au ₄ CdK ₂ S ₄ , Ba ₂ Bi ₂ Zn, Ba ₂ Br ₂ O, Ba ₂ I ₂ O, Ba ₂ Sb ₂ Zn, BeBr ₂ , BeCl ₂ , BeI ₂ , BiLiO ₂ , Br ₂ Hg ₅ O ₄ , Cd ₃ Cs ₂ Te ₄ , Cl ₂ Hg ₅ O ₄ , Cl ₃ La ₂ N, Cl ₆ Cs ₂ Pd ₂ , Cs ₂ GaLi ₃ O ₄ , Cs ₂ Hg ₃ S ₄ , Cs ₂ Hg ₃ Se ₄ , Cs ₂ P ₂ Si, Cs ₂ S ₄ Zn ₃ , F ₁₁ LaZr ₂ , GaK ₂ NaP ₂ , Ga ₂ Mg ₅ , Ge ₅ Ti ₆ , Hg ₂ O ₃ Se, I ₂ OSr ₂ , InK ₂ NaP ₂ , InK ₃ P ₂ , In ₂ Mg ₅ , K ₂ O ₂ Zn, K ₂ P ₂ Si, K ₂ Te ₂ Zn, MgO, Mg ₅ Tl ₂ , NaNb ₃ O ₈ , NaO ₈ Ta ₃ , Na ₂ S ₂ Zn, O ₂ Si, Pb ₅ Sc ₆ , Pt ₃ Sb ₂ , Pt ₅ Ti ₃ , Rb ₂ S ₄ Zn ₃ , S ₂ Si, Se ₂ Si,
73	AlAs ₂ Li ₃ , AlLi ₃ P ₂ , BiPS ₄ , Bi ₃ K ₃ Na ₂ Sn, Li ₄ N ₃ Ta,
74	Ag ₂ Ba, Ag ₂ Ca, Ag ₂ O ₇ Te ₂ , Ag ₂ Sr, AlB ₁₄ Li, AlF ₇ MgNa ₂ , AlF ₇ Na ₂ Zn, AlLaO ₃ , Al ₂ Sr, Au ₂ Ca, Au ₂ Sr, Au ₅ K ₃ Pb, B ₁₅ Na, B ₃ Si, B ₇ Mg, BaCd ₂ , BaGe ₅ , BaHg ₂ , BaIn ₂ , BaO ₃ Pb, BaZn ₂ , Ba ₂ O ₇ U ₂ , Be ₂ K ₂ O ₁₁ Si ₃ Zn ₂ , C ₂ B ₁₂ Mg, C ₂ B ₁₃ Li, CaCd ₂ , CaO ₃ Si, CaZn ₂ , Ca ₂ O ₇ Sb ₂ , Cd ₂ O ₇ Sb ₂ , Cd ₂ Sr, CsF ₃ MoO ₂ , CsF ₅ Pd ₂ , F ₅ Pd ₂ Rb, Ge, HfO ₃ Sr, Hg ₂ Sr, Hg ₃ I ₂ S ₂ , Hg ₃ I ₂ Se ₂ , KNa ₂ O ₁₅ Si ₆ Y, LaNb ₂ O ₇ Rb, MgO ₄ U, Mg ₂ O ₄ Si, MoTi, Na ₂ O ₇ Te ₂ , O ₂ PbPd, O ₃ SnSr, O ₃ SrZr, O ₄ SiZn ₂ , O ₇ Sb ₂ Sr ₂ , Si, Sr, SrZn ₂ , Te,
76	BO ₂ Tl, Br ₅ PbTl ₃ , Cl ₅ PbTl ₃ , Cl ₈ ISb, Cs ₃ P ₇ , Cs ₄ Ge ₉ , O ₃ PbTe,
79	AlF ₅ Sr, BrCl ₁₄ P ₃ , Br ₄ OW, Cl ₃ F ₂ Sb, Cl ₄ OW,
80	Ag ₃ BiO ₃ , AsNb, Ca ₁₁ O ₂₄ Re ₄ , Cs ₅ N ₁₀ NaW ₄ , Na ₂ O ₁₂ W ₃ Zr, NbO ₂ ,
81	As ₅ BO ₂₀ Pb ₆ , Au ₂ CaF ₁₂ , B ₈ Cd ₁₂ Ge ₁₇ O ₅₈ , CO ₄ Rb ₄ , C ₂ Ag ₁₀ F ₈ , GeSe ₂ , I ₃ NaO ₈ , KMo ₄ O ₆ , P ₂ S ₆ Zr, Ta ₂₂ , Ta ₃₀ ,
82	AgI ₃ O ₈ , AgKO, Ag ₂ HgI ₄ , AlAsO ₄ , AlO ₄ P, Al ₂ Be ₂ Cl ₂ Na ₈ O ₂₄ Si ₈ , Al ₂ CdS ₄ , Al ₂ CdSe ₄ , Al ₂ CdTe ₄ , Al ₂ HgS ₄ , Al ₂ HgSe ₄ , Al ₂ HgTe ₄ , Al ₂ Se ₄ Zn, Al ₂ Te ₄ Zn, Al ₄ Bi ₄ Cl ₁₆ S ₄ , Al ₄ Bi ₄ Cl ₁₆ Se ₄ , Al ₄ Bi ₄ Cl ₁₆ Te ₄ , AsBO ₄ , AsPd ₃ , As ₄ CsF ₁₃ , Au ₂ BaF ₈ , BGeLiO ₄ , BLiO ₄ Si, BaBr ₂ F ₈ , BeO ₄ S, Br ₁₆ Re ₄ Te ₈ , CF ₂ NO ₂ P, CK ₄ O ₄ , CaF ₈ HfLi ₂ , CdGa ₂ S ₄ , CdGa ₂ Se ₄ , CdGa ₂ Te ₄ , CdIn ₂ Se ₄ , CdIn ₂ Te ₄ , CdTe ₄ Tl ₂ , Cl ₁₆ Re ₄ S ₄ Te ₄ , Cl ₁₆ Re ₄ Se ₄ Te ₄ , Cl ₁₆ Re ₄ Te ₈ , Cl ₄ FTa, F ₁₃ KSb ₄ , FK ₅ La ₄ O ₁₆ Si ₄ , FNa ₅ O ₁₆ Si ₄ Y ₄ , GaN ₅ O ₁₄ , Ga ₂ HgS ₄ , Ga ₂ HgSe ₄ , Ga ₂ S ₄ Zn, Ga ₂ Se ₄ Zn, Ga ₂ Te ₄ Zn, GeHg ₂ Se ₄ , GeSe ₂ , GeTa ₃ , GeTi ₃ , Hf ₃ Sb, HgIn ₂ Se ₄ , HgIn ₂ Te ₄ , Hg ₂ Se ₄ Sn, InPS ₄ , In ₂ Se ₄ Zn, In ₂ Te ₄ Zn, LiPS ₄ Zn, Mo ₃ P, Nb ₉ O ₂₅ P, PW ₃ , SbZr ₃ , TeZr ₃ , Te ₃ Tl ₅ ,
84	BiCl ₆ Tl ₃ , Cl ₆ NaSb, Cs ₃ I ₆ La, F ₄ Zr, La ₂ O ₅ Pd ₂ , O ₈ SrTe ₃ , P ₂ S ₆ Th, P ₂ S ₆ U, P ₂ S ₆ Zr, PdS, PdSe, PtS,
85	AgClO ₄ Pb ₄ , AgI, Ag ₇ CsS ₄ , Ag ₇ RbS ₄ , AsClInbO ₅ Rb, AsCl ₂ F ₃ , As ₂ Cl ₄ F ₆ , Bi ₄ Cl ₁₄ Se ₄ , Br ₂ Sr, Br ₉ O ₄ Pb ₈ Tl, Cl ₄ F ₆ PSb, Cl ₅ P, I ₄ O ₁₂ Zr, La ₉ O ₅ Sb ₅ , P ₂ U, Se ₂ U,
86	Ag ₄ O ₄ Si, AsZr ₃ , As ₂ O ₃ , CK ₄ O ₄ , F ₃ KOTe, GeNb ₃ , GeTa ₃ , ILiO ₃ , Nb ₃ Si, PZr ₃ , SbY ₃ , SiTa ₃ ,
87	AlF ₆ K ₃ , Al ₃ F ₁₉ Pb ₅ , Au ₄ Ti, BBa ₂ Cl ₁₇ Zr ₆ , BaF ₁₁ LiZr ₂ , Ba ₂ CaO ₆ W, Ba ₂ O ₆ TaY, BiF ₅ , Br ₅ Hg ₆ S ₄ Tl, Br ₅ Hg ₆ Se ₄ Tl, Br ₆ Rb ₂ Te, C ₄ Al ₄ Th, CdO ₆ Sr ₂ W, Cl ₁₆ Hg ₃ Tl ₁₀ , CsGe ₄ Li ₁₂ Na ₃ O ₁₆ , CsKLi ₁₂ Na ₂ O ₁₆ Si ₄ , F ₁₃ KSb ₄ , F ₆ OXe ₂ , F ₇ IXe, GaO ₆ SbSr ₂ , GaO ₆ Sr ₂ Ta, Ga ₂ Te ₅ ,

Part 12 of all the predicted materials with band crossings from **Cases 1** or **2**:

87	Hf ₅ Te ₄ , I ₁₂ K ₄ O ₇ Ti ₄ , InO ₆ Sr ₂ Ta, K ₅ Te ₃ , La ₂ MoO ₅ , Li ₁₂ Na ₃ O ₁₆ RbSi ₄ , Li ₄ O ₅ U, MgMoO ₆ Sr ₂ , MgO ₆ ReSr ₂ , MgO ₆ Sr ₂ W, MoO ₆ Sr ₂ Zn, O ₃ PbTi, O ₅ Ti ₄ , O ₆ Sr ₂ TaY, O ₆ Sr ₂ TiZr, O ₆ Sr ₂ WZn, Se ₄ Ti ₅ , Te ₃ Tl ₅ , Te ₄ Ti ₅ , Te ₄ Zr ₅ ,
88	AgO, AsBiO ₄ , AsCa ₂ O ₁₂ W ₂ Y, Au ₂ BaO ₄ , Au ₂ CaO ₄ , Au ₂ O ₄ Sr, BaF ₁₁ NaZr ₂ , BaMoO ₄ , BaO ₄ W, BiF ₄ Li, BrCsO ₄ , Br ₄ Th, Br ₆ Rb ₂ Sb, CaF ₄ Zn, CaMg ₃ N ₄ Si, CaMoO ₄ , CaO ₄ Se, CaO ₄ W, CdMoO ₄ , Cl ₄ KTI, Cl ₄ SrZn, Cl ₄ Th, Cl ₄ Tl ₂ , F ₄ LiSc, F ₄ LiY, F ₄ SrZn, F ₇ K ₃ U, GeHfO ₄ , GeLi, GeLi ₃ NaO ₄ , GeO ₄ Th, GeO ₄ U, GeO ₄ Zr, Hg ₁₆ Rb ₁₅ , IInSe, IKO ₄ , INaO ₄ , IO ₄ Rb, IO ₄ Tl, LaMo ₄ Na ₅ O ₁₆ , LaNbO ₄ , LiSi, LuO ₄ P, MoO ₄ Pb, MoO ₄ Sr, Mo ₄ Na ₄ O ₁₆ U, Mo ₄ Na ₄ O ₁₆ Zr, Na ₂ O ₅ Si ₂ , Na ₅ O ₁₆ W ₄ Y, NbO ₂ , O ₂₄ Re ₄ Sr ₁₁ , O ₂ Ta, O ₄ PbPd ₂ , O ₄ PbW, O ₄ SiTi, O ₄ SiZr, O ₄ SrW, P ₄ Si ₁₂ U, Pd ₂ S ₄ U,
91	Ag ₃ O ₄ Sb, CBTh, LiNbO ₄ Zn, Li ₂ O ₄ Te, O ₄ TiZn ₂ ,
92	AlKO ₂ , AlLiO ₂ , As ₂ O ₅ , As ₄ Mg, Au ₅ F ₂₁ Pr ₂ , CO ₂ , Ca, Ca ₂ P ₄ Si ₂ , CdP ₂ , F ₂ Sn, GeO ₂ , Ge ₂ Lu ₂ O ₇ , Ge ₄ Zr ₅ , Hf ₅ Si ₄ , I ₈ Pt ₃ , La ₅ Si ₄ , O ₂ Si, O ₂ Te, P ₂ Zn, P ₄ Zn, S ₂ Tl ₂ , Si ₄ Zr ₅ ,
94	F ₆ Li ₂ Mo,
96	Ag ₂ HgO ₂ , AuF ₂₂ Sb ₄ Xe ₄ , B ₆ Be, Ba ₃ Sn ₂ , CdP ₂ , Ge, Na ₂ O ₃ Zn ₂ , O ₂ Te, P ₂ Zn,
97	Ca ₂ O ₂₀ Si ₈ Th,
98	As ₂ Cd, O ₂ Si,
99	BaO ₃ Ti, Bi ₂ O ₆ TiZn, Br ₃ CsPb, Cl ₃ CsPb, HfO ₃ Sr, O ₃ PbTi, O ₃ SrZr,
100	Ba ₂ NaNb ₅ O ₁₅ , Ba ₂ O ₈ Si ₂ Ti, K ₂ Nb ₂ O ₁₄ Si ₄ , La ₃ N ₁₁ Si ₆ , O ₈ Si ₂ Sr ₂ Ti,
102	Al ₂ Y ₃ , Ca ₃ Cd ₂ , Cs ₂ Hg ₆ S ₇ , K ₂ O ₇ Zn ₆ , N ₂ S ₄ ,
104	HgI ₆ Tl ₄ ,
105	AlPS ₄ , As ₂ BaGe ₂ , BaGe ₂ P ₂ ,
107	BaGe ₃ Pt, BaPdSi ₃ , BaPdSn ₃ , BaPtSi ₃ , BaPtSn ₃ , Br ₈ S ₉ Ta ₄ , CBaSi, CaPtSi ₃ , Ca ₂ Sb, Ge ₃ PdSr, Ge ₃ PtSr, Na ₆ O ₅ Pb, P ₂ U, PdSn ₃ Sr,
108	Al ₃ F ₁₉ Pb ₅ , ClF ₄ NO, K ₂ SnTe ₅ , Rb ₂ SnTe ₅ , Si ₃ Sr ₅ ,
109	AlGeLa, AsNb, AsTa, Ba ₂ S ₃ , Ga ₂ S ₂ Te, Ga ₂ Se ₂ Te, Li ₈ N ₂ Se, Li ₈ N ₂ Te, NbP, PTa,
110	As ₂ Zn ₃ ,
111	AgIn ₅ Se ₈ , AgIn ₅ Te ₈ , Ag ₂ HgI ₄ , As ₄ Ge ₃ , As ₄ Si ₃ , As ₄ Sn ₃ , C ₁₁ N ₄ , C ₃ As ₄ , C ₃ N ₄ , CdIn ₂ Se ₄ , F ₆ KSb, Ga ₂ S ₄ Zn,
112	AlPS ₄ ,
113	AgTe ₂ Y, B ₂ Ca ₂ O ₇ Si, BaS ₃ , BaSe ₃ , BaTe ₃ , Ba ₂ Ge ₂ MgO ₇ , Ba ₂ Ge ₂ OS ₆ Zn, Ba ₂ Ge ₂ O ₇ Zn, Ba ₂ MgO ₇ Si ₂ , BeCa ₂ O ₇ Si ₂ , Be ₂ F ₇ LiNa ₂ , Be ₂ GeLa ₂ O ₇ , Be ₂ GeO ₇ Y ₂ , Be ₂ O ₇ SiY ₂ , Br ₃ NbO, CN ₂ , Ca ₂ MgO ₇ Si ₂ , Ca ₂ O ₇ Si ₂ Zn, CdMoO ₆ Te, Cl ₃ NbO, Cl ₆ IP, Cs ₂ O ₁₆ S ₃ U ₂ ,

Part 13 of all the predicted materials with band crossings from **Cases 1** or **2**:

113	GaNb ₄ S ₈ , Ga ₂ La ₂ OS ₆ Zn, LiNbO ₆ W, Li ₆ O ₇ Si ₂ , MgO ₇ Si ₂ Sr ₂ , Mo ₃ O ₁₂ Y ₂ , N ₄ O ₃ Si ₃ Y ₂ , O ₃ W, O ₇ Si ₂ Sr ₂ Zn,
114	Ba ₄ Ga ₄ Se ₁₂ Sn, Ba ₄ Ga ₅ LiSe ₁₂ , Bi ₂ O ₃ , C ₁₉ Sc ₁₅ , C ₁₉ Y ₁₅ , C ₃₂ In ₄ O ₃₂ Re ₈ , Ga ₄ GePb ₄ Se ₁₂ , INb ₃ Se ₁₂ , Na ₃ PS ₄ , Na ₄ S ₄ Sn, Na ₄ Se ₄ Sn, O ₁₂ Se ₄ , O ₅ SSn ₂ , Pd ₄ S, Pd ₄ Se,
115	Bi ₂ O ₃ , Cl ₂ Mg, CsI ₃ Li ₂ , F ₂ OPb ₂ , GaHf ₂ Sb ₃ , Li ₃ N ₂ Na ₃ ,
116	BiF ₆ K, F ₆ KNb, F ₆ Pb ₂ , Ge ₇ Re ₄ , O ₂ Si,
117	AuBi ₂ NaO ₅ , Ca ₂ Ge ₇ O ₁₆ , Cd ₂ Ge ₇ O ₁₆ , O ₄ Pb ₃ , PdRb ₂ Se ₁₆ ,
118	B, CB ₂₄ Mg ₂ , O ₂ Si, O ₆ Sb ₂ Zn, P ₂ S ₈ Zn ₃ ,
120	AgAsF ₁₀ Xe ₂ , AgMgSb, AlCsF ₄ , AlF ₄ Rb, Br ₁₃ Cd ₃ Cs ₇ , O ₂ Si, O ₆ P ₄ S ₄ ,
121	AgClO ₄ , Ag ₂ BaGeS ₄ , Ag ₂ CdI ₄ , Ag ₂ KPS ₄ , Ag ₂ KS ₄ Sb, Ag ₂ S ₄ SnZn, AsHgS ₃ Tl, As ₂₂ Ba ₁₃ Si ₆ Sn ₈ , AuPb ₃ , CK ₄ O ₄ , CLi ₄ O ₄ , CN ₄ O ₄ , CaGeLi ₂ O ₄ , CaLi ₂ O ₄ Si, CdGeTe ₄ Tl ₂ , CdIn ₂ Se ₄ , CdK ₂ Se ₄ Sn, CdSnTe ₄ Tl ₂ , ClCsF ₃ Sb, F ₉ NaTh ₂ , GeHgTe ₄ Tl ₂ , GeLi ₂ PbS ₄ , GeO ₈ Zr ₃ , HgK ₂ Se ₄ Sn, HgRb ₂ SnTe ₄ , HgSe ₄ SiTl ₂ , HgSnTe ₄ Tl ₂ , Mo ₃ P, NbO ₈ Rb ₃ , O ₂ Si, O ₈ Rb ₃ Ta,
122	AgAlS ₂ , AgAlSe ₂ , AgAlTe ₂ , AgGaS ₂ , AgGaSe ₂ , AgGaTe ₂ , AgInS ₂ , AgInSe ₂ , AgInTe ₂ , AlLiTe ₂ , As ₂ BeSi, As ₂ CdGe, As ₂ CdSi, As ₂ CdSn, As ₂ GeMg, As ₂ GeZn, As ₂ MgSi, As ₂ SiZn, As ₂ SnZn, As ₃ Mg ₄ NaO ₁₂ , BLiO ₂ , B ₂ O ₄ Pd, B ₆ CsLiO ₁₀ , BeN ₂ Si, BeP ₂ Si, BeSb ₂ Si, CBeN ₂ , CKN ₃ O ₆ , CMgN ₂ , CN ₂ , CN ₂ Zn, CO ₂ , C ₂ HgN ₂ , C ₃ N ₃ P, CaGeN ₂ , CdGeP ₂ , CdP ₂ Si, CdP ₂ Sn, CdSb ₂ Sn, CdTe ₂ Zn, Cl ₁₀ N ₂ S ₂ Sb ₂ , Cl ₂ Zn, F ₄ OU, F ₅ U, GaLiO ₆ Se ₂ , GaLiTe ₂ , GeMgP ₂ , GeP ₂ Zn, GeS ₂ , GeSe ₂ , HgP ₂ Si, I ₂ P ₄ Se ₃ , InLiSe ₂ , InLiTe ₂ , LiN ₂ P, MgN ₂ Si, MgP ₂ Si, MgSb ₂ Si, N ₂ NaP, Na ₂ S ₄ , Na ₂ Se ₄ , O ₂ Si, O ₄ SiZn ₂ , P ₂ SiZn, P ₂ SnZn, S ₂ Si, Sb ₁₈ Zr ₁₁ ,
123	AgPPd ₅ , AgSbTe ₂ , AlF ₄ K, AlF ₄ Na, AlF ₄ Rb, AlF ₄ Tl, AlF ₅ K ₂ , As ₂ BaOTi ₂ , As ₃ Cd ₄ Cs, As ₃ CsZn ₄ , As ₃ RbZn ₄ , BCa ₃ N ₃ , Ba, BaGe ₃ Mg ₄ , BaMg ₄ Si ₃ , BaOSb ₂ Ti ₂ , BaO ₃ Ti, Ba ₃ N ₂ OZn, BiLi, BiNa, Bi ₂ ClLuO ₄ , Bi ₂ ILaO ₄ , Bi ₄ ClO ₈ Ta, Br ₄ K ₂ Pd, Br ₄ K ₂ Pt, CPd ₃ Sn, C ₂ AgK, C ₂ AuNa, CaF ₂ , Ca ₂ O ₁₀ RbTa ₃ , CdHg ₂ Ti, ClNa ₃ , Cl ₄ Cs ₂ Pd, Cl ₄ K ₂ Pd, Cl ₄ K ₂ Pt, Cl ₄ PdTi ₂ , CsI, CsNb ₃ O ₁₀ Sr ₂ , CsO ₁₀ Sr ₂ Ta ₃ , HgTi, HgZr, LaO ₇ RbTa ₂ , Li ₅ N ₂ Na, MgPt ₃ , MoPt ₃ , N ₃ Rb, NaNbO ₃ , NaO ₃ Ta, Nb ₃ O ₁₀ RbSr ₂ , O ₃ PbTi, P ₃ RbZn ₄ , Pb ₃ Sr, Pd ₃ Sn, Pt ₅ SiSn,
124	Au ₂ CdF ₈ , Au ₂ F ₈ Hg, I ₃ Nb ₁₀ Se ₄₀ ,
125	AgK ₃ Se ₈ Sn ₃ , AgRb ₃ Se ₈ Sn ₃ , Ag ₂ BaHg ₂ O ₄ , Al ₂ BaTe ₄ , As ₄ CaNa ₂ O ₁₂ , K ₃ NaSe ₈ Sn ₃ , O ₂ Si, Pb ₄ Pt,
126	Al ₄ Bi ₂ S ₈ , Al ₄ Bi ₂ Se ₈ , Bi ₂ Ga ₄ S ₈ , Bi ₂ Ga ₄ Se ₈ , K ₈ Tl ₁₀ Zn, LaMo ₂ O ₈ Rb,
127	AlF ₃ , AlF ₄ K, AlF ₄ Rb, AlPt ₃ , AuBi ₅ Na ₂ O ₁₁ , B ₄ Ca, B ₄ La, B ₄ Lu, B ₄ U, B ₄ Y, BaCl ₂ Hg ₂ O ₂ , BaLa ₂ O ₅ Pd, BaLa ₂ O ₅ Pt, BaO ₅ PdY ₂ , Ba ₃ F ₁₂ In ₂ , Ba ₄ In ₂ S ₅ Te ₂ , Ba ₄ In ₂ Se ₅ Te ₂ , CB ₂ Lu, CaO ₃ Si, Ca ₂ Ge ₂ Sn, CdGe ₂ Y ₂ , CsF ₅ K ₂ Pd, CsF ₇ Rb ₂ Si, CsI ₃ Sn, Cs ₃ F ₇ Ge, Cs ₃ F ₇ Si, Cs ₃ F ₇ Ti, F ₃ MgNa, F ₅ K ₂ PdRb, F ₅ PdRb ₃ , F ₇ K ₃ Si, F ₇ Rb ₃ Si, F ₇ Rb ₃ Ti, GaPt ₃ , GeTe ₅ Tl ₂ , HfO ₃ Sr, Hf ₃ In ₄ , Hg ₂ I ₂ PbS ₂ , In ₄ Ti ₃ , K ₂ LaNb ₅ O ₁₅ , K ₂ LaO ₁₅ Ta ₅ , K ₃ Li ₂ Nb ₅ O ₁₅ , Li ₂ Sn ₅ , NaO ₃ Ta, O ₃ SrZr, Pb ₃ Sr ₂ , Pt ₃ Si, Si ₂ Th ₃ , Si ₂ U ₃ ,

Part 14 of all the predicted materials with band crossings from **Cases 1** or **2**:

128	Al ₃ F ₁₄ Na ₅ , Br ₄ STl ₆ , Br ₆ HgTl ₄ , Br ₆ In ₂ Zr, Br ₆ K ₂ Te, Br ₆ Rb ₂ U, Br ₆ TeTl ₂ , CdI ₆ In ₄ , CdI ₆ Tl ₄ , Cl ₄ STl ₆ , Cl ₆ K ₂ Sn, F ₁₄ In ₃ K ₅ , F ₆ HfK ₂ , HgI ₆ Tl ₄ , InB ₃ Se ₁₂ , I ₄ STl ₆ , I ₄ SeTl ₆ , I ₆ K ₂ Pt, I ₆ Rb ₂ Te,
129	AcBrO, AcClO, AgAsOTh, AgBaFS, AgBaFSe, AgBaFTe, AgBrOPb, AgBr ₂ Cs, AgCl ₂ Cs, AgFSSr, AgFSeSr, AgFSrTe, AgKSe, AgLaOS, AgLaO ₄ Ti, AgLaSb ₂ , AgOPTh, AgSb ₂ Y, AlBaFGe, AlF ₃ , AlGeNa, AlNaSi, Al ₂ Au ₂ Sr, Al ₂ Au ₂ Th, AsBaFZn, AsBeLi, AsCaRb, AsCdK, AsFSrZn, AsGeNb, AsKMg, AsLaOZn, AsMgNa, AsNaZn, AsPU, As ₂ PdU, As ₂ U, AuLaSb ₂ , Au ₂ Ga ₂ Sr, Au ₂ Sn ₂ Sr, BaF ₄ Sn, BaGeMg, BaHfN ₂ , BaMgPb, BaMgSn, BaMg ₂ Pb ₂ , BaMg ₂ Sn ₂ , BaN ₂ Zr, BaO, BaPd ₂ Sb ₂ , BaSn ₂ Zn ₂ , Ba ₂ BrInO ₃ , Ba ₂ Br ₂ F ₁₀ Pb ₄ , Ba ₂ ClInO ₃ , Ba ₂ F ₁₀ I ₂ Pb ₄ , Ba ₂ FInO ₃ , Ba ₂ OTe, BeLiP, Be ₂ CaGe ₂ , BiBrO, BiCaK, BiClO, BiFO, BiIO, BiIO ₃ Te, BiLaOS ₂ , BiLaOSE ₂ , BiLiO ₄ Pd ₂ , Bi ₂ LaLi, Bi ₂ OS ₂ , Bi ₂ Pd ₂ Sr, BrFPb, BrLaO, BrLuO, BrNTh, BrNU, Br ₂ CsLi, CaClF, CaGaN, CaGa ₄ , CaRbSb, CdHf, CdKsB, CdTi, CdZr, Cd ₃ O ₅ Si, ClFPb, ClLaO, ClLaTe, ClNTh, ClNU, ClOY, Cl ₂ CsLi, CsF ₄ Ti, CsNaS, CsNaSe, CsNaTe, FIPb, FLaO, FLaS, FOY, FSy, FTl, F ₄ KMoNaO ₂ , F ₄ KNaO ₂ W, F ₄ PbSn, F ₅ KNaNbO, GeHfS, GeHfSe, GeHfTe, GeLi ₂ O ₅ Ti, GeNa ₂ O ₅ Ti, GeNbSb, GeSU, GeSZr, GeSeZr, Ge ₂ Pt ₂ Th, Ge ₂ Pt ₂ U, HfSi, HfSb ₂ , HfSeSi, HfSiTe, ILaO, ILuO, INTh, INU, In ₉ Li ₂ Y ₅ , KLaNaNbO ₅ , KLaNaO ₅ Ta, KLaO ₄ Ti, KLIS, KLiSe, KLiTe, KMgP, KMgSb, KNaO, LaLiO ₄ Ti, LaN, LaNaO ₄ Ti, LaOPZn, LaOSbZn, LaSbTe, LiNaS, LiRbS, LiRbSe, Li ₂ N ₂ Na ₄ , Li ₂ O ₅ SiTi, MgNaSb, N ₂ SrTi, NaORb, NaPZn, NaRbS, NaSbZn, Na ₂ O ₅ SiTi, OPb, OSTh, OSU, OSeTh, OSeU, OSiZr, OSn, OTeTh, OTeU, O ₃ W, P ₂ U, PdSb ₂ U, Pd ₂ Sb ₂ Sr, Pt ₂ Si ₂ Th, SSiU, SSiZr, SZr, Sb ₂ U, Sc, SeSiZr, SeTa ₂ , SeTi, SeZn, SiTeZr, SnTeU, SnTeZr,
130	Ba ₅ Ge ₃ , Ba ₅ Si ₃ , Bi ₂ O ₄ Pd, Ca ₅ Ge ₃ , ClSe ₂ Tl ₅ , Cl ₄ Na ₂ Pd, Ga ₃ Y ₅ , IK ₃ O ₅ , O ₃ W, O ₅ SiSr ₃ , PbSe ₃ Tl ₄ , S ₃ SnTl ₄ ,
131	C ₂ Th, CaO ₄ Pt ₂ , F ₆ PbSr, IPdTe, LiNSr,
132	AgF ₆ Ta, Ag ₂ Cs ₂ S ₄ Ti,
133	PTa ₃ ,
135	CB ₂ Lu, CB ₂ Sc, Cs, O ₂ Se, O ₄ Pb ₃ , O ₄ Sb ₂ Zn, PdSe,
136	Ag ₅ CsSe ₃ , Ag ₅ CsTe ₃ , Al ₂ Hf ₃ , Al ₂ Lu ₃ , Al ₂ Y ₃ , Al ₂ Zr ₃ , As ₂ BrLa ₃ O ₇ , AuLi ₃ O ₃ , AuNa ₃ O ₂ , BLi ₃ N ₂ , BN, BaCd ₄ Pt ₂ , BaHg ₂ Tl ₂ , BaHg ₂ Tl ₂ , BaIn ₂ La ₂ O ₇ , BaLa ₂ O ₇ Sc ₂ , Ba ₃ Ge ₄ , Ba ₃ S ₇ Zr ₂ , Ba ₃ Si ₄ , BeO, Be ₂ K ₂ Na ₄ O ₅ , BiLi ₃ O ₄ , Br ₂ Ca, CO ₂ , C ₂ Mg, Ca ₁₀ Mg ₂ Sb ₉ , CaCl ₂ , Cd ₄ Pt ₂ Sr, Cl ₃ NbO, Cl ₃ OW, Cs ₂ K ₂ O ₅ Te, F ₂ Kr, F ₂ Mg, F ₂ Pd, F ₂ Zn, F ₆ GeLi ₂ , F ₆ Li ₂ Mo, F ₆ Li ₂ Pd, F ₆ Li ₂ Pt, F ₆ Na ₂ Sn, Ga ₂ O ₆ Te, Ga ₃ Re, Ga ₅ Nb ₄ , GeO ₂ , Hg ₂ Na ₃ , I ₃ OW, KPPdS ₄ , LiO ₃ RbZn ₂ , Li ₂ Sr ₃ , MgO ₆ Sb ₂ , MgO ₆ Ta ₂ , MoO ₂ , N ₂ , O ₂ Si, O ₂ Sn, O ₂ Ti, O ₂ W, O ₆ Sb ₂ Zn,

Part 15 of all the predicted materials with band crossings from **Cases 1** or **2**:

137	As ₂ Zn ₃ , BLiSi ₂ , B ₄ Cl ₄ , Ba ₂ LiN, Ba ₂ S ₆ Th, Ba ₂ S ₆ U, CaO ₃ Si, Cd ₄ F ₆ O, Cl ₂ Zn, F ₂ OPb ₂ , GeSe ₂ , HfO ₂ , HgI ₂ , Hg ₂ I ₄ , Li ₁₀ O ₉ Zn ₄ , Li ₆ MoN ₄ , Li ₆ N ₄ W, Li ₆ O ₄ Zn, O ₂ Zr, P ₂ Zn ₃ ,
138	AuBr, CLiO ₂ , Cl ₂ , Cl ₆ Se ₄ Zr, F ₆ Pb ₂ Zn, O ₄ SnSr ₂ ,
139	AgBrO ₃ , AgClO ₃ , AgCsO, AgNaO, AgORb, Ag ₂ BaGe ₂ , Ag ₂ BaSn ₂ , Ag ₂ Cl ₆ Cs ₂ , Ag ₂ La ₂ O ₁₀ Ti ₃ , Al ₂ BaGe ₂ , Al ₂ CaGa ₂ , Al ₂ FK ₄ Nb ₁₁ O ₂₀ , Al ₂ Pd ₅ U, Al ₃ Hf, AsCa ₂ , AsTiZr, As ₂ BaZn ₂ , As ₂ Ba ₂ O ₂ Zn ₃ , As ₂ Ca ₄ O, AuCsO, Au ₂ Be, Au ₂ Br ₆ Cs ₂ , Au ₂ CaGe ₂ , Au ₂ CaSi ₂ , Au ₂ Cl ₆ Cs ₂ , Au ₂ Cs ₂ I ₆ , Au ₂ Ge ₂ Sr, Au ₂ Si ₂ Sr, Au ₂ Si ₂ U, Ba ₁₁ Bi ₁₀ , BaBi ₂ Cd, BaBi ₂ Zn, BaBi ₄ I ₂ O ₄ , BaCdSb ₂ , BaCd ₂ Ge ₂ , BaGe ₂ Mg ₂ , BaMg ₂ Si ₂ , BaP ₂ Zn ₂ , BaP ₄ Pd ₂ , BaSi ₂ , BaSi ₂ Zn ₂ , Ba ₂ F ₂ O ₂ Pd, Ba ₂ F ₆ Zn, Ba ₂ N ₂ Zn, Ba ₂ O ₄ Pb, Ba ₂ O ₄ Sn, Ba ₂ O ₄ Zr, Ba ₃ Br ₂ In ₂ O ₅ , Ba ₃ Cl ₂ In ₂ O ₅ , Ba ₃ Cl ₂ O ₅ Tl ₂ , Ba ₃ S ₇ Zr ₂ , Ba ₄ OSb ₂ , Be ₁₂ Mo, Be ₁₂ W, BePd ₂ , Bi ₁₀ Ca ₁₁ , Bi ₁₀ Sr ₁₁ , BiCa ₂ , Bi ₂ Ca ₄ O, Bi ₂ CdSr, Bi ₂ O ₂ Se, Bi ₂ O ₉ SrTa ₂ , Bi ₂ Pd, Bi ₂ SrZn, Br ₂ Ca ₃ Si, Br ₂ Hg ₂ , Br ₃ Li ₇ O ₂ , C, CLi ₂ N ₂ , C ₂ PtU ₂ , C ₂ Si ₂ U ₃ , C ₄ AuBa ₄ KO ₄ , CaCs ₂ F ₄ , CaGe ₂ Zn ₂ , CaIn, CaO ₃ Si, CaSi ₂ Zn ₂ , CaSi ₃ , Ca ₂ GeO ₄ , Ca ₂ N ₂ Zn, Ca ₂ O ₄ Si, Ca ₂ Pd ₃ Sb ₄ , Ca ₄ OP ₂ , Ca ₄ OSb ₂ , CdCl ₄ Rb ₂ , CdHF ₂ , CdHg ₂ , Cd ₂ Ga ₂ Sr, Cd ₂ Ge ₂ Sr, Cd ₂ Hg, Cl ₁₀ K ₄ ORe ₂ , Cl ₂ Hg ₂ , Cl ₄ K ₂ Mg, Cl ₆ Cs ₂ HgPd, Cl ₇ Cs ₃ Mg ₂ , CsF ₃ Li ₂ , Cs ₂ F ₄ Hg, Cs ₂ HgO ₂ , Cs ₂ I ₆ Pd, Cs ₃ F ₆ Tl, Cs ₃ F ₆ Y, F ₂ Hg ₂ , F ₂ Xe, F ₃ La, F ₄ HgRb ₂ , F ₄ K ₂ Mg, F ₄ MgRb ₂ , F ₄ Pb, F ₄ Sn, F ₆ Rb ₃ Tl, F ₆ Rb ₃ Y, F ₇ K ₃ Zn ₂ , F ₈ Na ₂ U, F ₈ Na ₃ Pa, Ga ₁₀ Hf ₁₁ , Ga ₃ K ₂ , Ga ₃ Zr, Ga ₄ Ti ₂ Zr, GeLaSc, GeSTh, GeSeU, GeTeU, Ge ₂ Pd ₂ Th, Ge ₂ Pt ₂ Th, Ge ₂ Pt ₂ U, Ge ₂ SrZn ₂ , Ge ₄ In ₆ La ₁₁ , Hf ₂ Zn, Hg, Hg ₂ I ₂ , Hg ₂ In ₂ Sr, Hg ₂ Mg, In ₃ Rb ₂ , In ₃ Zr, K ₂ Mg ₅ Sn ₃ , K ₂ O ₄ U, K ₂ O ₇ SrTa ₂ , La ₁₁ Sn ₁₀ , LaSbSc, LaScSi, La ₂ O ₄ Pd, LiPd ₂ Tl, Li ₂ O ₇ SrTa ₂ , LuSbZr, MgO ₆ ReSr ₂ , MgPd ₃ , Mg ₂ O ₄ Si, Mo ₃ Sb ₇ , N ₂ Sr ₂ Zn, N ₂ TeTh ₂ , OP ₂ Sr ₄ , O ₂ TeU ₂ , O ₄ Rb ₂ U, O ₄ SnSr ₂ , O ₄ Sr ₂ Ti, O ₇ Sr ₃ Ti ₂ , PtTeU, PdTi ₂ , Pd ₂ Si ₂ Th, Pd ₂ Ti, Pt ₂ Si ₂ Th, Pt ₂ Si ₂ U, Pt ₂ Th, Pt ₈ Ti, SSiTh, SbYZr, SeSiTh, SeSiU, Si, Sn, ThZn ₄ , Ti ₂ Zn,
140	AgAuF ₄ , AgF ₄ K, AgF ₄ Na, AgI ₂ Tl, AgN ₃ , AlFO ₄ Sr ₃ , AlF ₄ Tl, AlKTe ₂ , AlLaO ₃ , AlNaSe ₂ , AlNaTe ₂ , AlSe ₂ Tl, AuF ₁₁ Th ₂ , AuF ₄ K, AuF ₄ Na, AuF ₄ Rb, B ₂ Mo ₅ Si, BaBe ₂ N ₂ , BaF ₄ Pd, BaLa ₂ O ₅ Zn, BaLa ₂ S ₅ Zn, BaO ₃ Pb, BaO ₃ Zr, BaTe ₂ , BaTe ₅ U ₂ , Ba ₃ ClInS ₄ , Ba ₃ ClInSe ₄ , Ba ₃ O ₅ Si, Ba ₃ S ₅ Ti, Ba ₄ Bi ₃ KO, Ba ₄ KOSb ₃ , Ba ₄ ORbSb ₃ , Ba ₆ S ₁₄ Zn ₆ Zr, BeTa ₂ , Be ₄ Ca ₂ N ₄ , Be ₄ N ₄ Sr ₂ , Bi, Bi ₃ In ₅ , Br ₁₃ Cd ₃ Cs ₇ , BrF ₄ K, BrF ₄ Rb, BrSe ₂ Tl ₅ , BrTe ₂ Tl ₅ , Br ₅ CdCs ₃ , Br ₅ CsSn ₂ , Br ₅ Cs ₃ Zn, Br ₅ InSn ₂ , Br ₅ Pb ₂ Rb, Br ₅ RbSn ₂ , Br ₅ Sn ₂ Tl, C ₂ B ₂ Ca, CaF ₄ Pd, CaO ₃ Si, CaO ₃ Ti, Ca ₅ Hg ₃ , Cd ₃ Sr ₅ , Cl ₃ Li ₅ O, Cl ₅ CsPb ₂ , Cl ₅ CsSn ₂ , Cl ₅ Cs ₃ Zn, Cl ₅ KSn ₂ , FGaO ₄ Sr ₃ , F ₄ PbPd, F ₄ PdSr, GaInSe ₂ , GaNaTe ₂ , GaTe ₂ Tl, Ga ₂ Lu ₃ , Ga ₂ Sc ₃ , Ga ₂ Y ₃ , Ga ₃ Ta ₅ , GeNb ₃ , GePt ₃ , Ge ₃ Sr ₅ , HfO ₃ Sr, Hf ₂ Si, ISe ₂ Tl ₅ , I ₅ InPb ₂ , I ₅ InSn ₂ , I ₅ InSr ₂ , I ₅ KSn ₂ , InKTe ₂ , InNaTe ₂ , InRbTe ₂ , InS ₂ Tl, InSe ₂ Tl, InTe, InTe ₂ Tl, In ₅ Sb ₃ , KN ₃ , Lu ₇ Sb ₃ , Mg ₂ Pt, MoO ₃ Sr, NO ₂ SrTa, N ₃ Tl, NaPPdS ₄ , O ₃ SnSr, O ₃ SrTi, O ₃ SrZr, PbSe ₂ , PbSe ₃ Tl ₄ , Pb ₂ Pt, PtTl ₂ , STl, S ₂ Sr, S ₂ Tl ₂ , Sb, SbTi ₃ , Sb ₂ Ti, Sc, SeTl, Se ₂ Tl ₂ , Se ₃ SnTl ₄ , SiTa ₂ , SiU ₃ , SiZr ₂ , Si ₃ Sr ₅ , SnTe ₃ Tl ₄ , SnTe ₅ Tl ₂ , Sn ₃ Sr ₅ ,
141	AgLi, Ag ₈ O ₄ S ₂ Si, AlLi, Al ₂ Mg, Al ₂ S ₃ , Al ₂ Ti, AsLuO ₄ , AsO ₄ Sc, AsO ₄ Y, As ₂ Cs ₂ O ₈ Th, AuBr,

Part 16 of all the predicted materials with band crossings from **Cases 1** or **2**:

141	AuCl, BF ₅ Li ₂ , BLi ₃ N ₂ , BMo, BNbO ₄ , BO ₄ Ta, BW , BaCd ₁₁ , BaGe ₂ , BaO ₇ U ₂ , BeF ₁₂ Li ₆ Zr, Br ₁₂ Rb ₄ Sb ₂ , BrCsO ₄ , Br ₄ Th, Br ₆ Cs ₂ Sb, Caln ₂ O ₄ , CaSi ₂ , CaZn ₁₁ , Cd ₁₁ Sr, CdIn ₂ O ₄ , Cl ₂ O, Cl ₆ Cs ₂ Sb, FMg ₂ N, F ₂ Na ₂ O ₈ SiU ₂ , GaZr , Ga₂Hf , Ga₂Th , Ge , GeO ₄ Th, HfO ₄ Si, HgI ₂ , I ₄ Te, In ₂ S ₃ , In₂Zr , LaO ₄ P, LiO ₂ Sc, Li ₄ N ₂ Sr, N ₂ OSi ₂ , NbP , O ₂ Ti, O ₃ U, O ₄ SiTh, O ₄ SiTi, PTa , PbU , S₂Zr₉ , ScSn₂ , Si , Si ₂ Sr, Si ₂ Th, Si ₂ U, Sn , SrZn ₁₁ ,
142	Al ₂ CaCl ₈ , Al ₂ Cl ₈ Sr, As ₂ Zn ₃ , Au₃Zn , BeI ₂ , Be ₃ P ₂ , Br ₂ Zn, C ₂ Na ₂ , CsGe, CsPb, CsSi, CsSn, Cs ₂ PdSe ₈ , Cs ₄ Sn ₄ , Ga ₂ Pt, GeK, GeRb, KPb, KSi, KSn, K ₄ Sn ₄ , K ₈ Pb ₈ , LaPS ₄ , NaP ₇ , NaPb, NaSn, Na ₄ Sn ₄ , PbRb, Pb ₄ Rb ₄ , RbSi, RbSn, Rb ₄ Sn ₄ ,
143	Al ₅ Mo, BaGe ₄ O ₉ , Ba ₃ N ₄ O ₉ Si ₆ , Br ₂ Hg, C ₃ N ₄ , F ₆ Na ₂ U, Ge ₃ O ₁₁ Pb ₅ , Ge ₉ O ₃₃ Pb ₁₅ , K ₂ O ₉ Si ₃ Zr, LaNb ₇ O ₁₉ , Li ₇ O ₆ Ta, MgO, Na ₄ O ₁₂ Ti ₅ , S ₆ ,
144	AsBBaO ₅ , B ₂ O ₃ , Bi ₂ O ₇ Sn ₂ , CsNO ₃ , F ₄ KTL, F ₄ KY, Hg ₃ O ₆ S, TeZn,
145	BeCl ₂ ,
146	Ag ₂ Nb ₄ O ₁₁ , Ag ₃ IS, AlLiO ₄ Si, Al ₄ B ₆ O ₁₅ , As ₁₂ Sn ₃ Sr ₁₄ , AsLiO ₄ Zn, B ₂ BaO ₄ , B ₃ Cl ₆ N ₃ , Ba ₃ Lu ₄ O ₉ , Ba ₃ O ₉ Y ₄ , Bi ₃ Pd ₈ , C, CCs ₄ O ₄ , CK ₄ O ₄ , CNa ₄ O ₄ , CdPS ₃ , Cl ₃ CsGe, Cs ₆ S ₂₇ Ti ₆ , F ₃ MoNa ₃ O ₃ , GaLiO ₄ Si, Ga ₄ Pd ₇ Zn ₃ , GeLa ₂ MgO ₆ , IKO ₃ , InMg ₃ , KO ₁₂ Sb ₃ Zn ₄ , K ₂ O ₃ Sn ₂ , K ₂ O ₉ Si ₃ Ti, K ₄ O ₁₈ Si ₆ Sn ₂ , Li ₂ O ₆ TeZr, Li ₇ O ₆ Sb, Mg ₉ Sn ₅ , Nb ₂ O ₆ Pb, O ₁₁ PbTa ₄ , Pd ₈ Sb ₃ , STl ₂ ,
147	Al ₂ BaO ₈ Si ₂ , As ₂ K ₂ S ₆ Sn, As ₂ S ₆ SnTl ₂ , As ₆ BiK ₃ Se ₁₂ , Au₇In₃ , BaCa ₂ MgO ₈ Si ₂ , Ba ₃ MgO ₈ Si ₂ , Bi ₂ O ₆ U, Bi₂Pt , Br ₃ InK, C ₃ N ₄ , Cd ₂ Na ₁₄ O ₉ , Cd ₃ Cl ₃ P, F ₆ KNaTh, Ge ₂ K ₂ O ₇ Pb ₂ , Ge₉Pd₂₅ , InSiTe ₃ , K ₂ O ₃ Te, K ₂ O ₇ Pb ₂ Si ₂ , K ₃ NaO ₈ Se ₂ , Li ₁₄ N ₆ O ₃ P ₂ , Li ₂ N ₂ Th, Li ₂ N ₂ U, Na ₂ O ₃ S, O ₇ Si ₂ Tl ₆ , O₈U₃ , O ₉ SZr ₃ , Rb ₄ Sb ₆ Sn,
148	AgAsS ₂ , AgBiP ₂ Se ₆ , AgI ₃ Tl ₂ , AgO ₃ Sb, Ag ₂ I ₆ O ₁₈ Ti, AlF ₃ , AlF ₆ K ₂ Li, AlGeLiO ₄ , AsCsF ₆ , AsF ₆ In, AsF ₆ K, AsF ₆ Li, AsF ₆ Na, AsF ₆ Rb, AsF ₆ Tl, AsI ₃ , AsLiO ₃ , AuClO, AuF ₆ Li, B ₂ BaO ₆ Ti, B ₂ CaO ₆ Sn, B ₂ MgO ₆ Sn, B ₆ Ba ₂ O ₁₂ Pb, B ₆ Si ₂ Sr ₃ , BaBiO ₃ , BaF ₆ Sn, Ba ₂ BiLuO ₆ , Ba ₂ BiO ₆ Sb, Ba ₂ BiO ₆ Ta, Ba ₂ Bi ₂ O ₆ , Ba ₂ LaO ₆ Sb, Ba ₂ LaO ₆ Ta, Ba ₂ O ₆ SrTe, Ba ₂ O ₆ SrU, Ba ₂ O ₆ SrW, Ba ₂ O ₆ TiZr, Ba ₉ O ₂₄ Sc ₂ Si ₆ , BeF ₄ Li ₂ , BiCsF ₆ , BiF ₆ Li, BiF ₆ Na, BiF ₆ Rb, BiI ₃ , BiNaO ₃ , Bi ₂ Si ₂ Te ₆ , Br ₁₄ Re ₆ Te ₁₄ , BrCsF ₆ , Br ₃ Pt, Br ₆ W, CCs ₂ I ₁₈ Zr ₇ , Cl ₁₂ Zr ₆ , C ₂ MgNa ₂ O ₆ , CaF ₆ Pd, CaF ₆ Pt, CaF ₆ Si, CaF ₆ Sn, CaO ₃ Sn, Ca ₂ Hf ₇ O ₁₆ , Ca ₃ O ₆ U, CdF ₆ Pd, CdF ₆ Pt, CdF ₆ Sn, CdF ₆ Ti, CdGeO ₃ , CdO ₃ S, CdO ₃ Sn, CdO ₃ Ti, Cd ₂ P ₂ Se ₆ , Cl₁₂NSc₇ , Cl ₁₈ Cs ₂ Nb ₆ Pb, Cl ₁₈ Cs ₂ PbTa ₆ , Cl ₁₈ K ₂ Nb ₆ Sr, Cl ₂ Pd, Cl ₃ Pt, Cl ₃ Sc, Cl ₆ W, Cl ₈ O ₁₂ Si ₈ , CsF ₆ Nb, CsF ₆ Sb, CsO ₈ Te ₃ Y, Cs ₂ I ₆ O ₁₈ Zr, Cs ₈ OTl ₈ , FKO ₆ Te ₃ , F ₃₁ Rb ₇ Th ₆ , F ₃ N ₃ S ₃ , F ₆ LiNb, F ₆ LiSb, F ₆ LiTa, F ₆ MgPb, F ₆ PbZn, F ₆ PdZn, F ₆ PtZn, F ₆ RbSb, F ₆ SnZn, Ge, GeMgO ₃ , GeO ₃ Pb, GeO ₃ Zn, GeO ₄ Zn ₂ , Ge ₂ In ₂ Te ₆ , HfTe ₄ Tl ₄ , I ₃ InO ₉ , I ₃ O ₉ Sc, I ₃ O ₉ Tl, I ₃ Sb, I ₃ Y, I ₆ K ₂ O ₁₈ Zr, I ₆ O ₁₈ Rb ₂ Zr, In ₆ O ₁₂ Te, In ₆ O ₁₂ W, La ₄ O ₁₂ Ti ₃ , La ₆ O ₁₂ U, Li ₁₆ N ₈ Nb ₂ O, Li ₁₆ N ₈ OTa ₂ , LiNbO ₃ , LiS ₂ Sb, Li ₂ O ₄ Se, Li ₂ O ₄ W, Li ₆ O ₆ Te, Li ₆ O ₆ U, Li ₈ O ₆ Pb, Li ₈ O ₆ Pt, Li ₈ O ₆ Sn, Lu ₆ O ₁₂ U, MgO ₁₃ Te ₆ , MgO ₃ Ti, Mg ₂ P ₂ Se ₆ , Mg ₃ O ₆ Te, Mo₁₈S₂₂Tl₄ , Mo₃S₄ , Mo₃Se₄ , Mo₆S₈ ,

Part 17 of all the predicted materials with band crossings from **Cases 1** or **2**:

148	NaNbO ₃ , NaO ₃ Sb, Na ₈ O ₁₈ Si ₇ , Nb ₆ O ₁₂ Ti ₂ , O ₁₂ TeTl ₆ , O ₁₂ TeY ₆ , O ₁₂ UY ₆ , O ₁₂ WY ₆ , O ₂ Si, O ₃ SbTl, O ₃ SiZn, O ₃ SnZn, O ₃ TiZn, O ₄ SiZn ₂ , O ₆ TeTl ₆ , O ₉ Te ₄ , P ₂ S ₆ Sn ₂ , S, S ₆ , Se ₆ , Si,
149	As ₂ CaO ₆ , GeIO ₆ Rb, GeO ₆ SrTe, OTi ₃ , O ₆ PbSb ₂ ,
150	AlCaF ₆ Na, AlF ₃ , AlF ₆ LiMg, As ₂ Cl ₉ Cs ₃ , As ₂ O ₁₄ Pb ₃ TeZn ₃ , B ₂ Ga ₂ K ₂ O ₇ , BaGe ₄ O ₉ , Ba ₃ Ga ₂ Ge ₄ O ₁₄ , Ba ₃ Ga ₃ NbO ₁₄ Si ₂ , Bi ₂ Cl ₉ Cs ₃ , Ca ₃ Ga ₃ O ₁₄ Si ₂ Ta, Cl ₉ Cs ₃ Sb ₂ , Cs ₂ O ₃ Te, F ₆ GeLi ₂ , F ₆ GeNa ₂ , F ₆ K ₂ U, F ₆ Li ₂ Si, F ₆ Na ₂ Pt, F ₆ Na ₂ Th, F ₆ Na ₂ U, Ga ₂ Ge ₄ O ₁₄ Pb ₃ , Ga ₃ NbO ₁₄ Si ₂ Sr ₃ , Ga ₃ O ₁₄ Si ₂ Sr ₃ Ta, Ga ₅ La ₃ O ₁₄ Sn, Ge ₄ O ₉ Pb, Ge ₄ O ₉ Sr, In ₂ O ₆ Te, K ₂ O ₆ S ₂ , La ₂ O ₃ , O ₆ Rb ₂ S ₂ , O ₆ Sc ₂ Te, O ₆ TeTl ₂ ,
151	Cl ₃ Ti, Li ₅ O ₆ Re,
152	AgPb ₄ Pd ₆ , AlAsO ₄ , AsBO ₄ , AsGaO ₄ , BF ₄ Li, BO ₅ PSr, B ₂ O ₃ , B ₇ Cs ₃ Li ₄ O ₁₄ , BaO ₂ Zn, BeF ₂ , CdTe, GeO ₂ , HgO, HgS, HgTe, Hg ₃ O ₆ S, K ₂ P ₂ Se ₆ , Li ₂ O ₄ SiSr, O ₂ Si, O ₂ Ti, P ₂ Rb ₂ Se ₆ , Se, TeZn,
154	AlO ₄ P, HgO, HgO ₂ Sr, HgS, O ₂₃ S ₅ Te ₄ , S, Te,
155	AlF ₃ , Al ₂ B ₂ BaO ₇ , Al ₂ BaO ₇ Sb ₂ , Al ₇ Te ₁₀ , AsF ₇ Sn, BBe ₂ CsF ₂ O ₃ , BBe ₂ F ₂ KO ₃ , C ₄ CaMg ₃ O ₁₂ , Ca ₃ Na ₂ O ₉ Ta ₂ , F ₃ Sc, Ga ₃ InTe ₅ , Ga ₃ NaTe ₅ , Ga ₇ Te ₁₀ , In ₇ Te ₁₀ , O ₂ Si, O ₈ RbS ₂ Tl,
156	AgAlS ₂ , Ag ₆ ClF ₃ Mo ₂ O ₇ , AlF ₆ K ₂ Li, BBeLi, BiTe, Br ₇ Nb ₃ S, CSi, CdGaInS ₄ , CdI ₂ , I ₂ Pb, I ₇ Nb ₃ Te, InLiMo ₃ O ₈ , In ₂ S ₆ Zn ₃ , LiMo ₃ O ₈ Sc, LiMo ₃ O ₈ Y, SZn, Sb ₂ Te ₃ ,
157	As ₅ Cs ₃ O ₉ , Au ₆ Cs ₄ S ₅ , Bi ₂ Pt,
158	F ₆ O ₄ P ₄ ,
159	AgBa ₇ Ga ₅ Se ₁₅ , AlKO ₄ Si, Ba ₃ MoN ₄ , Bi ₂ O ₃ , Br ₆ Cl ₈ Cs ₂ Mo ₆ , Br ₆ Cl ₈ Cs ₂ W ₆ , C ₃ N ₄ , Ge ₃ N ₄ , K ₅ NaSe ₂₇ Ti ₆ , Mo ₃ O ₁₂ SeTl ₂ , N ₄ Si ₃ , O ₁₂ Rb ₂ TeW ₃ , OTi ₆ ,
160	AgNO ₃ , Al ₂ MgS ₄ , Al ₂ MgSe ₄ , Al ₂ S ₄ Zn, AsS ₃ Tl ₃ , AsSe ₃ Tl ₃ , As ₂ Sn ₂ Sr, As ₂ Te ₃ , As ₄ Pb ₉ S ₁₅ , BN, B ₃ Be ₃ F ₄ NaO ₉ Sr ₃ , BaO ₃ Ti, Be ₃ N ₂ , Bi ₂ Ge ₃ Te ₆ , Bi ₂ O ₃ , Bi ₂ Te ₃ , BrCsO ₃ , BrKO ₃ , BrO ₃ Rb, BrO ₃ Tl, Br ₃ CsGe, CAgN, CCs ₄ O ₄ , CIN, CLi ₄ O ₄ , CNa ₄ O ₄ , COS, CO ₄ Rb ₄ , C ₃ Al ₄ , C ₃ Al ₆ N ₂ , C ₃ N ₄ , C ₅ Al ₄ Zr ₂ , C ₆ Al ₄ Zr ₃ , Ca ₃ O ₅ Si, Cd ₄ K ₆ Se ₁₃ Sn ₃ , ClKO ₃ , ClO ₃ Rb, ClO ₃ Tl, Cl ₂ Zr, Cl ₃ CsGe, Cl ₈ Na ₂ Ti ₃ , CsGeI ₃ , F ₄ OU, GaSe, GeTe, IKO ₃ , IO ₃ Rb, I ₃ S ₂₄ Sb, InSe, In ₂ S ₅ Zn ₂ , In ₂ Se ₃ , In ₃ O ₁₂ Sb ₅ , KNbO ₃ , Li ₅ NaSn ₄ , MoS ₂ , MoSe ₂ , N ₃ Na, Nb ₂ O ₆ Pb, PbS, SZn, S ₂ Ta, S ₂ W, S ₃ SbTl ₃ , S ₃ Ti, Sb ₂ Se ₂ Te, Se ₂ Ta,
161	AgNO ₃ , AgO ₃ Ta, Ag ₂ Nb ₄ O ₁₁ , Ag ₃ AsS ₃ , Ag ₃ AsSe ₃ , Ag ₃ NO ₃ Se, Ag ₃ S ₃ Sb, AlBiO ₃ , B ₂ BaO ₆ Zr, B ₇ ClO ₁₃ Zn ₃ , B ₉ BaNaO ₁₅ , B ₉ LiO ₁₅ Sr, BiCs ₂ Mo ₃ NaO ₁₂ , Br ₄ Ga ₂ , CdCl ₆ KRb ₃ , CdF ₃ Na, Cl ₃ LuO ₁₂ , CsF ₃ Pb, GaLaO ₃ , Ga ₂ I ₄ , GeO ₃ Zn, Ge ₃ La ₄ S ₁₂ , I ₄ InRb, K ₃ SbSe ₄ , LiO ₃ Ta, NaNbO ₃ , O ₁₀ P ₄ , O ₃ PbZn, O ₃ SnZn, O ₃ TiZn, O ₅ P ₂ , Pd ₈ Sb ₃ , Si ₃₈ Te ₁₆ ,
162	As ₂ CdO ₆ , As ₂ HgO ₆ , As ₂ Hg ₂ O ₆ , As ₂ O ₆ Sr, Au ₇ IP ₁₀ , BaO ₆ Sb ₂ , BiI ₃ , CdO ₆ Sb ₂ , Cl ₃ Ti, Cl ₄ Mo, F ₆ HfLi ₂ ,

Part 18 of all the predicted materials with band crossings from **Cases 1** or **2**:

162	F ₆ Li ₂ Zr, In ₄ O ₇ Rb ₂ , K ₂ Mg ₂ O ₇ Si ₂ , O ₆ PbSb ₂ , O ₆ Sb ₂ Sr, O ₈ Ta ₂ U,
163	AgGaP ₂ Se ₆ , AgInP ₂ Se ₆ , AgP ₂ S ₆ Sc, AgP ₂ ScSe ₆ , Ag ₅ HgO ₆ Sb, AlCaF ₆ Li, AlF ₆ LiSr, Al ₂ B ₂ Na ₂ O ₇ , Br ₆ Na ₃ Sc, CaF ₆ GaLi, Cl ₁₈ CsLuNb ₆ , Cl ₆ InNa ₃ , Cs ₂ I ₁₄ Mo ₆ , GeNa ₂ O ₆ Te, I ₆ Li ₂ U, I ₆ PbTh, I ₆ SnTh, O ₂ Si, O ₃ SbTl, Pt ₃ Tl ₂ ,
164	Ac ₂ O ₃ , AgBiS ₂ , AgBiSe ₂ , AgScSe ₂ , Ag ₂ BaS ₂ , AlCsMo ₂ O ₈ , AlLaSi ₂ , AlMo ₂ O ₈ Tl, Al ₂ CaGe ₂ , Al ₂ CaSi ₂ , Al ₂ Cs ₂ O ₇ Sb ₂ , Al ₂ Ge ₂ Sr, Al ₂ K ₂ O ₇ Sb ₂ , Al ₂ MgSi ₂ , Al ₂ Mg ₂ Se ₅ , Al ₂ O ₇ Rb ₂ Sb ₂ , Al ₂ Si ₂ Sr, As ₂ BaCd ₂ , As ₂ BaMg ₂ , As ₂ Be ₂ Ca, As ₂ Be ₂ Mg, As ₂ CaCd ₂ , As ₂ CaMg ₂ , As ₂ CaZn ₂ , As ₂ Cd ₂ Sr, As ₂ Ge ₂ Te ₅ , As ₂ LaLi ₃ , As ₂ Mg ₂ Sr, As ₂ Mg ₂ Zn, As ₂ Mg ₃ , As ₂ SrZn ₂ , Au ₃ Cs ₂ , Au ₃ Cs ₂ , Au ₃ RbSe ₂ , BN, BaBi ₂ Mg ₂ , BaCd ₂ P ₂ , BaCd ₂ Sb ₂ , BaMgO ₈ Si ₂ Sr ₂ , BaMg ₂ P ₂ , BaMg ₂ Sb ₂ , BaSn ₂ , Ba ₃ MgO ₉ Ta ₂ , Ba ₃ Nb ₂ O ₉ Zn, Ba ₃ O ₉ SrTa ₂ , Ba ₅ Nb ₄ O ₁₅ , Be, Be ₂ CaP ₂ , Be ₂ MgN ₂ , Be ₂ MgP ₂ , Be ₃ N ₂ , Bi ₂ Br ₉ Cs ₃ , Bi ₂ CaMg ₂ , Bi ₂ LaLi ₃ , Bi ₂ Li ₃ Y, Bi ₂ Mg ₂ Sr, Bi ₂ Mg ₃ , Bi ₂ Pb ₂ Se ₅ , BrNZr, Br ₂ Ti, Br ₆ Na ₂ U, Br ₉ Cs ₃ Sb ₂ , CN ₂ O ₂ Y ₂ , CNb ₂ S ₂ , CS ₂ Ta ₂ , C ₂ Al ₂ Mg, C ₂ Na ₂ Pd, C ₂ Na ₂ Pt, C ₈ B ₂ N ₈ Zn, CaCd ₂ P ₂ , CaCd ₂ Sb ₂ , CaGe ₂ , CaI ₂ , CaMg ₂ N ₂ , CaMg ₂ Sb ₂ , CaP ₂ Zn ₂ , CaSi ₂ , Ca ₂ GeO ₄ , Ca ₂ O ₄ Si, Ca ₃ N ₂ , CdI ₂ , CdO ₄ S, Cd ₂ P ₂ Sr, Cd ₂ Sb ₂ Sr, ClNZr, Cl ₂ Mg, Cl ₆ Cs ₂ Th, Cl ₆ Cs ₂ U, Cl ₆ Na ₂ U, Cl ₆ U, Cl ₉ Cs ₃ Sb ₂ , Cs ₂ F ₆ Hf, Cs ₂ F ₆ Pt, Cs ₂ F ₆ Sn, Cs ₂ F ₆ Zr, Cs ₃ I ₉ Sb ₂ , F ₃ OP, F ₆ GeNa ₂ , F ₆ Hg ₃ S ₂ Si, F ₆ K ₂ Pt, F ₆ K ₂ Ti, F ₆ Na ₂ Si, F ₆ Na ₂ Ti, F ₆ PtRb ₂ , F ₆ Rb ₂ Zr, F ₆ S, F ₆ SnTl ₂ , F ₆ Ti ₂ Tl ₂ , Ga ₂ I ₂ Y ₂ , GeI ₂ , GeI ₂ La ₂ , GeSb ₄ Te ₇ , Ge ₂ Sr, HfS ₂ , HfSe ₂ , Hf ₂ N ₂ S, HgPt ₂ Se ₃ , I ₂ Mg, I ₂ Zn, In ₂ Se ₃ , KMo ₂ O ₈ Sc, K ₂ Li ₄ O ₆ U, K ₃ NaO ₈ Se ₂ , K ₄ O ₁₂ Zr ₅ , LaLi ₃ P ₂ , LaLi ₃ Sb ₂ , La ₂ O ₂ Se, La ₂ O ₃ , Li ₂ N ₂ Zr, Li ₂ SiZn, Lu ₂ O ₂ S, Lu ₂ O ₃ , Mg ₂ N ₂ Sr, Mg ₂ Sb ₂ Sr, Mg ₃ Sb ₂ , MoO ₄ Tl ₂ , Mo ₂ O ₈ ScTl, N ₂ SZr ₂ , N ₂ SeTh ₂ , NaO ₆ S ₂ Tl ₃ , NaO ₈ Rb ₃ W ₂ , O ₂ Pt, O ₂ SY ₂ , O ₃ Sc ₂ , O ₃ U, O ₃ Y ₂ , P ₂ SrZn ₂ , PdTe ₂ , Pd ₄ Se ₆ Tl ₂ , PtSe ₂ , PtTe ₂ , Pt ₃ U, Pt ₄ S ₆ Tl ₂ , Pt ₄ Se ₆ Tl ₂ , Pt ₄ Te ₆ Tl ₂ , S ₂ Sn, S ₂ Ti, S ₂ Zr, Sb ₂ Te, Se ₂ Sn, Se ₂ Zr, Te ₂ Ti, Te ₆ Zr ₅ ,
165	Al ₂ O ₈ Si ₂ Sr, Ba ₃ Bi ₂ O ₉ Te, F ₁₈ InSb ₃ , F ₃ La, F ₃ Y, F ₆ Li ₃ Sc, Ge ₃ O ₉ Rb ₂ Ti, InKO ₈ W ₂ , InLi ₃ O ₃ , LiTe ₃ , Mg ₄ Nb ₂ O ₉ , Mg ₄ O ₉ Ta ₂ , NaTe ₃ , Nb ₂ O ₉ Zn ₄ ,
166	AgAsSe ₂ , AgBiSe ₂ , AgBiTe ₂ , AgGeLi ₂ , AgInO ₂ , AgInS ₂ , AgLuO ₂ , AgO ₂ Sc, AgSbTe ₂ , Ag ₃ As ₂ K ₃ , AlCaF ₁₄ Mg ₃ Na ₃ , AlCs ₂ F ₆ Na, AlF ₆ K ₂ Li, AlLaO ₃ , AlLiO ₂ , AlNaO ₂ , AlO ₂ Tl, Al ₂ MgS ₄ , Al ₃ Cs ₂ F ₁₂ Na, As, AsB ₆ , AsCa ₂ I, AsF ₆ K, AsNaTe ₂ Zr ₂ , As ₂ B ₁₂ , As ₂ Ba ₃ O ₈ , As ₂ BeK ₄ , As ₂ CaGa ₂ , As ₂ CdK ₄ , As ₂ GeTe ₄ , As ₂ HgK ₄ , As ₂ K ₄ Zn, As ₂ Te ₃ , As ₃ Cd ₄ K, AuF ₆ K, Au ₃ K ₃ Sb ₂ , Au ₃ Rb ₃ Sb ₂ , B, B ₁₂ , B ₁₂ P ₂ , B ₁₂ S, B ₁₂ Si ₃ , BS ₂ Tl, B ₂ Ba ₂ MgO ₆ , B ₂ Mo, B ₄ Mo ₂ , B ₆ O, B ₆ P, B ₉ MgN, BaF ₆ Ge, BaF ₆ Pb, BaF ₆ Ti, BaGe ₂ Li ₂ Mg ₂ , BaHgO ₂ , BaLi ₂ Mg ₂ Si ₂ , BaO ₃ Si, Ba ₂ BrN, Ba ₂ CIN, Ba ₂ CIP, Ba ₂ FN, Ba ₂ Mg ₁₇ , Ba ₃ Nb ₂ O ₈ , Ba ₃ O ₉ Sc ₄ , Ba ₈ O ₂₄ Re ₂ W ₃ , BeK ₄ P ₂ , Be ₂ F ₈ K ₂ Pb, Be ₂ F ₈ K ₂ Sr, Bi, BiKLi ₆ O ₆ , BiRbS ₂ , BiS ₂ Tl, BiSe ₂ Tl, BiTe ₂ Tl, Bi ₂ Se ₂ Te, BrCa ₂ N, BrHfN, BrLa, BrNSr ₂ , BrNZr, Br ₂ Ca ₃ Si, Br ₂ Cd, Br ₂ Zn, Br ₇ In ₄ , C, CaIOsc, CB ₄ , CCl ₂ Lu ₂ , CMgN ₂ , CS ₁₄ , CS ₂ Ta ₂ , CY ₂ , C ₂ Ca, C ₂ CaK ₂ O ₆ , C ₂ K ₂ MgO ₆ , C ₃ Al ₄ , C ₃ B ₁₂ , C ₅ Ti ₈ , C ₆ Al ₄ Hf ₃ , CaF ₆ Ti, CaGe ₂ , CaHgO ₂ , CaO ₄ U, CaSi ₂ , Ca ₂ CIN, Ca ₂ F ₄ , Ca ₂ IP, Ca ₂ O ₈ Pt ₃ , CdCl ₂ , CdNa ₄ P ₂ , CdO ₄ U, CIHN, CILa, CILi ₄ N, CIMg ₂ N, CINSr ₂ , CINZr, CIOY, ClSc, ClY, Cl ₂ CsI, Cl ₂ CsKO ₈ ,

Part 19 of all the predicted materials with band crossings from **Cases 1** or **2**:

166	<p>Cl₂Li₅N, Cl₂Mg, Cl₂Pt, Cl₃Re, Cl₈Na₂Ti₃, Cl₉Re₃, CsLaS₂, CsLuS₂, Cs₂F₆GaNa, Cs₂F₆NaTi, Cs₂O, Cs₂O₁₂Te₄, Cs₂Pt₄Se₆, Cs₄F₁₂Ga₂KLi, FLaO, FLuS, FNTh, FOY, F₂O₂U, F₆GaLiRb₂, F₆PbPt, F₆SbTl, Ga, GaGeTe, GaLiO₂, GaO₂Tl, GaP, GaS, GeI₂La₂, GeI₂Y₂, HfIn, HfN₂Sr, Hg, HgK₄P₂, HgNa₄P₂, HgO₂Sr, INSr₂, INZr, I₂La₂Te, I₂Zn, I₈Nb₃, InKO₂, InK₅Pb₈, InLiSe₂, InMg₃, InNaS₂, InNaSe₂, InP₃, InS₂Tl, In₂Te₃, KLaO₂, KLaS₂, KLaTe₂, KLi₆O₆Ta, KLuS₂, KO₂Sc, KO₂Tl, KO₂Y, KO₃Pd₂, KS₂Y, KTe₂Y, K₂O₃Sn₂, K₂O₈PbS₂, K₂Pt₄S₆, K₂Pt₄Se₆, K₄P₂Zn, LaNaSe₂, LaO₁₂Sb₅, LaO₂Rb, LaRbS₂, LaRbSe₂, LiS₂Sc, LiS₂Y, LiSe₂Y, Li₂O, Li₄Mo₃O₈, Li₄P₂Sr, Li₆O₆U, Li₈Pb₃, LuNaS₂, LuO₂Rb, LuRbS₂, LuRbSe₂, LuS₂Tl, LuSe₂Tl, LuTe₂Tl, MgN₂Si, MgO, N₂NaNb, N₂NaTa, N₂SrZr, N₂W, N₃Na, N₄Th₃, NaO₂Sc, NaO₂Tl, NaS₂Sc, NaS₂Y, NaSe₂Y, Nb₆Zn₇, OPYZn, OTl₂, O₂, O₂RbSc, O₂RbTl, O₂RbY, O₃Rb₂Sn₂, O₄SrU, P, Pd₃S₂Tl₂, Pt₂Te₃, Pt₃Te₄, Pt₄Rb₂Se₆, RbS₂Y, STi, S₂TlY, Sb, ScTe₂Tl, SeTi, Se₂TlY, Ta₆Zn₇, TeZr₃, Te₂TlY,</p>
167	<p>AgHg₃O₆Sb, AgO₃Ta, Ag₂Nb₄O₁₁, Ag₂O₁₁Ta₄, Ag₅IO₆, AlBO₃, AlF₃, Al₂B₂CaO₇, Al₂O₃, Al₃As₅Ba₃, Al₃Ba₃P₅, Al₃Bi₅Br₁₂, Al₃Bi₅Cl₁₂, Al₆Ge₅, As₃CsO₁₂Zr₂, As₃KO₁₂Zr₂, As₃LiO₁₂Zr₂, As₃NaO₁₂Ti₂, As₃NaO₁₂Zr₂, AuK₃Se₂, AuNa₃S₂, Au₃F₁₂La, BBe₂F₂KO₃, BGaO₃, BInO₃, BNaO₂, BO₃Sc, B₂Ca₃O₆, B₂Hg₃O₆, B₃K₃O₆, B₃K₃S₆, B₃Na₃O₆, B₃Na₃S₆, B₃Rb₃S₆, Ba₂Re₆S₁₁, Ba₃BeCl₁₈Zr₆, Ba₃BiNaO₆, Ba₃Ga₃P₅, Ba₃NaNbO₆, Ba₃NaO₆Sb, Ba₃NaO₆Ta, Ba₃O₉W₂, Ba₄O₆Pt, Ba₆O₁₈W₄, BiNaO₆Sr₃, Bi₅Cl₁₂Ga₃, Br₄ORB₆, Br₆CdRb₄, Br₆Cs₄Pb, Br₆PbRb₄, Br₉Cs₃Y₂, CCdO₃, CMgO₃, CO₂, CO₃Zn, C₄K₂N₄Zn, Ca₁₄Si₁₉, Ca₃N₂, Ca₄O₆Pd, Ca₄O₆Pt, CdCl₆K₄, CdCl₆Rb₄, CdO₆PtSr₃, Cd₂Mo₁₅Se₁₉, ClCs₈Ga₁₁, Cl₄Cs₆O, Cl₄ORB₆, Cl₆Cs₄Pb, Cl₉Cs₃In₂, Cl₉Cs₃Lu₂, Cl₉Cs₃Sc₂, Cl₉Cs₃Tl₂, Cl₉Cs₃Y₂, Cl₉In₅, CsN₃O₁₁U, F₃Ga, F₃In, F₃Sc, GaLaO₃, Ga₂O₃, Ge₃Hf₂Na₄O₁₂, HeO₂Si, In₂O₃, In₂S₃, K₂O₁₁Ta₄, LiNO₃, LiNbO₃, LiNbO₆Sr₃, LiO₆SbSr₃, LiO₆Sr₃Ta, Lu₂S₃, MgO₆PtSr₃, Mo₁₅Se₁₉, Mo₁₅Se₁₉Tl₂, NNaO₃, N₂, NaNbO₆Sr₃, NaO₆SbSr₃, NaO₆Sr₃Ta, Na₂Nb₄O₁₁, Na₂O₁₁Ta₄, Na₄O₁₂Si₃Sn₂, Na₄O₁₂Si₃Zr₂, O₂Si, O₃Te, O₆PdSr₄, O₆PtSr₃Zn, O₆PtSr₄, Pd₈Sb₃, Re₆S₁₁Sr₂,</p>
169	<p>AlInS₃, AlInSe₃, AlNaO₄Si, Al₂S₃, GaInS₃, GaInSe₃, In₂Se₃,</p>
170	<p>In₂Se₃,</p>
173	<p>AgLa₃Se₇Si, AgLa₃Se₇Sn, AlCdLa₃S₇, AlGeKO₄, AlI₃O₉, AlLa₃MgS₇, AlLa₃S₇Zn, AlNaO₄Si, Al₂BaO₄, Al₂CaO₄, Al₂O₄Sr, AsNaO₄Zn, AsO₄Tl₃, As₃ClO₉Pb₅, B₂Bi₂O₇Sr, Ba₄ClGe₃NaS₁₀, BeLa₃S₇Sc, Br₃KTi, Cl₁₄Sn₂W₃, Cs₂I₄O₁₁, Cs₂Mo₃O₁₂Se, Cs₂Mo₃O₁₂Te, Cs₂O₁₂SeW₃, F₁₀NaSb₃, GaI₃O₉, GaNaO₄Si, I₃InO₉, I₃P, KLiMoO₄, LaO₃Tl, N₄P₂Sr, N₄Si₃, NaS₇SiY₃,</p>
174	<p>Ag₅RbS₃, BCdLiO₃, Ba₇Cl₂F₁₂, Br₂F₁₂Pb₇, C₁₂N₁₆, ClLiNaO₃, C₆N₈, Cl₂F₁₂Pb₇, GaSe, Ga₉O₂S₁₃Tl₃, K₂O₉Si₃Zr, Li₂O₂,</p>

Part 20 of all the predicted materials with band crossings from **Cases 1** or **2**:

176	AcBr ₃ , AcCl ₃ , Al ₆ B ₅ F ₃ O ₁₅ , As ₃ Ca ₂ ClO ₁₂ Pb ₃ , As ₃ ClO ₁₂ Sr ₅ , As ₃ ClO ₉ Pb ₅ , As ₃ FO ₁₂ Sr ₅ , As ₆ Cl ₂ O ₁₈ Pb ₁₀ , As ₆ Cl ₂ O ₂₄ Pb ₁₀ , BBr ₃ , BCl ₃ , BF ₃ Mg ₃ O ₃ , BI ₃ , Ba ₃ Nb ₂ O ₉ Sr, Ba ₃ O ₉ SrTa ₂ , Ba ₄ Nb ₂ O ₉ , Ba ₄ O ₉ Ta ₂ , Bi ₂ Ge ₃ O ₉ , Bi ₂ O ₉ Si ₃ , Bi ₂ S ₄ Sr, Br ₂ Sn, Br ₃ La, Br ₃ La ₉ Sb ₁₆ , Br ₉ K ₃ Mo ₂ , CCl ₄ NOSb, C ₃ N ₄ , CaMg ₂ O ₁₂ S ₃ , Ca ₃ Ge ₄ , CdMo ₃ O ₁₂ Th, Cl ₁₈ NNaW ₆ , Cl ₃ La, Cl ₃ La ₃ O ₆ U, Cl ₃ La ₃ O ₆ W, Cl ₉ K ₃ Mo ₂ , Cl ₉ K ₃ W ₂ , Cs ₂ Ge ₃ O ₉ Sn, Cs ₂ Ge ₃ O ₉ Ti, Cs ₂ O ₉ Si ₃ Zr, Cs ₅ Mo ₂₁ S ₂₃ , Cs ₅ Mo ₂₁ Se ₂₃ , GaN ₃ Sr ₃ , Ga ₂ O ₉ Te ₃ , Ge ₃ N ₄ , Ge ₃ O ₉ Sb ₂ , Ge ₃ O ₉ TiTi ₂ , Ge ₆ Na ₄ O ₁₅ Sr, K ₂ O ₉ Si ₃ Sn, K ₂ O ₉ Si ₃ Ti, K ₂ O ₉ Si ₃ Zr, K ₂ O ₉ Si ₄ , Mo ₁₅ S ₁₉ , Mo ₉ Se ₁₁ , N ₄ Si ₃ , O ₉ Rb ₂ Si ₃ Sn, O ₉ Rb ₂ Si ₃ Th, O ₉ Rb ₂ Si ₃ Ti, O ₉ Sc ₂ Se ₃ ,
178	AgF ₃ , AuF ₃ ,
180	AlLiO ₄ Si, BLaPt ₂ , C ₈ Cs, CaO ₄ S, Ge ₂ Nb, HfSn ₂ , Hg ₂ INaO ₂ , O ₂ Si, Si ₂ W,
181	AlLiO ₄ Si, AlO ₄ P,
182	Al ₂ BaO ₄ , BaHgO ₂ , CaO ₁₁ Ta ₄ , F ₃ La, IO ₆ RbSn, O ₁₁ SrTa ₄ , O ₂ Si, O ₃ SbTl,
183	Ta ₂₁ Te ₁₃ ,
185	AsCs ₃ , AsNa ₃ , B ₃ Ba ₃ O ₉ Sc, B ₉ Li, Ba ₆ Nb ₁₄ O ₄₇ Si ₄ , Cs ₃ F ₉ Ga ₂ , F ₃ La, GaO ₃ Y, GeLi ₈ O ₆ , I ₃ RbTi, InO ₃ Y, Li ₈ O ₆ Si, Lu ₂ S ₃ , NNa ₃ , O ₃ W, Pd ₅ Sb ₂ ,
186	AgGeLa, AlAs ₄ Ca ₃ Na ₃ , AlCa ₃ Na ₃ Sb ₄ , AlP, AlSb, Al ₄ BeMgO ₈ , AsBrHg ₃ S ₄ , AsBrHg ₃ Se ₄ , AsClHg ₃ S ₄ , AsHg ₃ ISe ₄ , As ₄ GaN ₃ Sr ₃ , BN, BP, BaN ₇ Si ₄ Y, Ba ₄ Br ₆ O, Ba ₄ Cl ₆ O, Ba ₄ I ₆ O, Ba ₄ LiNb ₃ O ₁₂ , Ba ₄ LiO ₁₂ Ta ₃ , Ba ₅ Li ₂ O ₁₅ W ₃ , BeO, Be ₄ NaO ₇ Sb, Bi ₂ O ₃ , Br ₂ Cd, Br ₃ CdCs, Br ₆ OSr ₄ , C, CSi, C ₃ Al ₃ Sc, C ₃ Al ₅ N, C ₄ Al ₄ Si, CaGe ₂ , CaO, CaOSZn, Ca ₂ O ₄ Si, Ca ₄ Cl ₆ O, CdI ₂ , CdK ₆ O ₄ , CdO, CdS, CdSe, CdTe, ClInK ₆ Te ₄ , Cl ₃ La ₄ NS ₃ , Cl ₆ OSr ₄ , F ₈ K ₃ Ta, GaN, GaNa ₃ P ₄ Sr ₃ , GaP, GaSe, Ge ₈ Li ₇ Rb, HgK ₆ S ₄ , HgRb ₆ S ₄ , HgRb ₆ Se ₄ , ILi, I ₂ Pb, I ₇ Nb ₃ Te, I ₇ SeTa ₃ , I ₇ Ta ₃ Te, InN, In ₂ S ₄ Zn, In ₂ S ₅ Zn ₂ , KSbSn, K ₄ O ₃ Sb ₂ , K ₆ MgO ₄ , LaMo ₂ O ₅ , LaN, LiMo ₂ O ₈ Tl ₃ , LiSbZn, MgSe, MgTe, Mg ₂ Mo ₃ O ₈ , Mo ₃ O ₈ Zn ₂ , NTL, N ₇ Si ₄ SrY, NaPSn, Na ₆ P ₄ W, Na ₆ S ₄ Zn, O ₂ Pt, O ₈ SiSn ₆ , P ₃ Sc ₇ , PdSnU, S ₂ Sn, SeZn, Se ₂ Ta, Si, TeZn,
187	AsBaLi, AsKZn, AuGaHf, AuGaZr, AuLuSi, AuScSi, BN, BaLiP, BrLi ₁₀ N ₃ , Br ₂ Ca ₃ Si, CHf, C ₂ AgLi, GaSe, Ga ₄ LiY, HfN ₂ , Hg, InNbS ₂ , InNbSe ₂ , InS ₂ Tl, InSe, KSbZn, LiPSr, LuPPT, NY, N ₂ W, NbSe ₂ , O ₂ RbSc, PPTy, PbS,
188	BaGe ₃ O ₉ Sn, BaO ₉ Si ₃ Sn, BaO ₉ Si ₃ Ti, BaO ₉ Si ₄ , Be ₃ F ₉ KZn, BiO ₁₉ Ta ₇ , Ge ₃ KO ₉ Ta, Ge ₃ NbO ₉ Rb, Ge ₃ O ₉ RbTa, Ge ₃ O ₉ TaTl, LaO ₁₉ Ta ₇ ,
189	AgAsCa, AgCaP, AgGeSc, AgLaMg, AgLuSi, AgMgY, AgPbY, AgSiY, AlCsF ₄ , AlMgY, AsCa, AsCs, AsLuPd, AsNaSr, AsSr, As ₂ Sr ₂ , AuCdLa, AuGaMg, Au ₂ K ₃₈ Na ₁₂ Tl ₄₈ , Au ₇ IP ₁₀ , BLiPt ₃ , B ₂ Ba ₃ O ₁₂ Ti ₃ , BaBiNa, BaCl ₂ , BaI ₂ , BaNaP, Ba ₃ Nb ₆ O ₂₆ Si ₄ , Ba ₃ O ₂₆ Si ₄ Ta ₆ , Ba ₅ Mg ₁₈ Si ₁₃ , CFMgO ₃ Rb, CaCdGe, CaCdPb, CaCdSn, CaP, CaPbPd, Ca ₂ P ₂ , CsRb ₁₄ Tl ₂₇ , F ₆ HfK ₂ , F ₆ K ₂ Th, F ₆ K ₂ U, F ₆ Rb ₂ Th, GaLaMg, GaMgY, Ge ₁₂ Mg ₁₉ Sr ₅ , GeLiY, GeO ₃ Sr, GePdTi, Ge ₃ La ₂ Zn ₆ , Ge ₄ K ₆ Nb ₆ O ₂₆ , InLaPt, InMgY, K ₂ S ₂ , K ₂ Se ₂ , K ₂ Te ₂ , K ₆ O ₂₆ Si ₄ Ta ₆ ,

Part 21 of all the predicted materials with band crossings from **Cases 1** or **2**:

189	LaMgTi, LiSiY, Lu ₆ MoSb ₂ , MgTiY, NaPSr, Na ₂ O ₂ , Na ₂ S ₂ , OTi, O ₂₆ Si ₄ Sr ₃ Ta ₆ , O ₂ Ti, O ₈ U ₃ , PSr, Pd ₅ Th ₃ , PtSnU, Pt ₅ Th ₃ , Rb ₂ S ₂ , Rb ₂ Se ₂ , Rb ₂ Te ₂ , Se ₂ U,
190	Ag ₂ Al ₂ Bi ₂ Cl ₈ S ₃ , Ag ₂ I ₁₀ Tl ₆ , Ag ₅ KS ₃ , Ag ₅ RbS ₃ , Au ₆ K ₄ S ₅ , Au ₆ Rb ₄ S ₅ , CCl ₁₈ W ₆ , C ₃ K ₃ NaO ₁₁ U, F ₃ La ₃ O ₉ Si ₃ , IO ₇ Sb ₅ , I ₂ K ₉ Li ₃ O ₁₃ , K ₃ Nb ₃ O ₁₃ Si ₂ ,
191	As ₄ BrKO ₆ , As ₄ ClKO ₆ , As ₄ IKO ₆ , B ₂ Sr, B ₂ Ti, B ₂ Zr, BaSi ₂ , BaSn ₅ , C ₂ Ca, CaPd ₅ , CaSi ₂ , CaZn ₅ , FN ₃ Ta ₂ , Ga ₂ Sr, Li ₂ Pd, Li ₂ Pt, Li ₃ N, O ₁₄₄ Si ₇₂ , O ₃ W, Pd ₅ Sr, Si, Ti, Ti ₂ Zr,
193	As ₂ O ₆ Sr, Ca ₁₀ Ge ₃ Pt ₇ , Ca ₁₀ Pt ₇ Si ₃ , Ca ₆ GaN ₅ , GaN ₅ Sr ₆ , Ge ₃ Ti ₅ , Ge ₃ Zr ₅ , K ₂ O ₃ Pb, NbSb ₅ U ₃ , O ₁₉ Ta ₆ Th ₂ , O ₂ Si, O ₃ W, Pb ₃ SZr ₅ , Pb ₃ TeZr ₅ , Pb ₃ Zr ₅ , Sn ₃ Ti ₅ , Sn ₃ Zr ₅ ,
194	AgAlO ₂ , AgBaP, AgBaSb, AgGaO ₂ , AgInO ₂ , AgO ₂ Sc, AgO ₂ Y, AgPSr, AgSbSr, Al ₁₂ O ₁₉ Sr, AlAs, AlAuO ₂ , AlBa ₂ InO ₅ , AlC ₈ S ₆ K ₃ Sb ₄ , AlK ₆ Na ₃ Sb ₄ , ALi, AlN, AlNTi ₂ , AlNZr ₂ , AlN ₃ Nb ₄ , AlN ₃ Ti ₄ , AlO ₃ Y, Al ₂₂ Na ₂ O ₃₄ , Al ₂ Hf, Ar, AsBeNa, AsF ₅ , AsHgK, AsKZn, AsK ₃ , AsLi ₃ , AsNa ₃ , AsPtY, AsRb ₃ , As ₂ AuK ₅ , AuBaBi, AuCs ₃ O, AuGaO ₂ , AuInO ₂ , AuK ₅ P ₂ , AuO ₂ Sc, AuO ₂ Y, BMg ₃ N ₃ , BN, B ₂ W, Ba, BaGaGe, BaLiP, BaLiSb, BaO, BaO ₃ Si, BaO ₃ Ti, BaS ₃ Ti, BaSe ₃ Ti, BaSe ₃ Zr, Ba ₃ BiN, Ba ₃ NSb, Ba ₃ Nb ₂ O ₉ Sr, Ba ₃ O ₉ SrTa ₂ , Ba ₃ O ₉ Te ₂ , Ba ₆ O ₁₇ Ti ₄ Y ₂ , Be, BeHfSi, BeNaSb, BeSe, BeSiZr, Be ₂ Mo, Bi ₂ Cs ₃ I ₉ , BrHg ₂ N, BrK ₃ Mo ₂ O ₇ , Br ₃ CsMg, Br ₈ Cs ₃ Mo ₂ , Br ₉ Mo ₂ Rb ₃ , C, CBLi, CCdTi ₂ , CGeNb ₂ , CGeTi ₂ , CHf ₂ Pb, CHf ₂ Sn, CK ₂ O ₃ , CN ₂ O ₂ Y ₂ , CN ₂ O ₃ , CNb ₂ S, CNb ₂ Sn, CPbTi ₂ , CPbZr ₂ , CSnTi ₂ , CSnZr ₂ , C ₂ AlTa ₃ , C ₂ Al ₃ O ₅ Sc ₃ , C ₂ SiTi ₃ , C ₂ SnTi ₃ , C ₃ Al ₃ Lu, C ₃ Al ₃ Sc, C ₃ Al ₃ Y, C ₆ Au ₃ Cs ₂ N ₆ Na, CaGaGe, CaGaSn, CaGa ₂ P ₂ , CaGeZn, CaIn ₂ P ₂ , CaSiZn, Ca ₂ IN, Ca ₃ N ₂ , Ca ₄ Mg ₁₃ Zn ₂₉ , Cd, CdCl ₃ Cs, CdMg ₃ , CdNa ₂ Sn, Cl ₃ CsMg, Cl ₃ MgRb, Cl ₅ Sb, Cl ₉ Cs ₃ Mo ₂ , Cl ₉ Cs ₃ Ti ₂ , Cl ₉ Cs ₃ W ₂ , Cl ₉ Mo ₂ Rb ₃ , Cs, CsI ₃ Mg, CsLuS ₂ , Cs ₂ O ₄ S, Cs ₂ Pt, Cs ₃ F ₃ Mo ₂ O ₆ , Cs ₃ I ₉ Mo ₂ , Cs ₃ I ₉ Sb ₂ , Cs ₃ I ₉ Y ₂ , Cs ₃ I ₉ Zr ₂ , Cs ₆ GaK ₃ Sb ₄ , F ₁₈ Mg ₆ Rb ₆ , FSY, F ₂ Sr, F ₃ La, F ₃ MgRb, F ₃ RbZn, GaGeSr, GaInO ₃ , GaInO ₅ Zn ₂ , GaInO ₇ Zn ₄ , GaK ₆ Na ₃ Sb ₄ , GaS, GaSe, GaSnSr, GaTe, He, HfN ₂ , HfP, Hf ₉ Re ₄ S, Hf ₉ Re ₄ Se, HgKSb, Hg ₃ U, ILa, ILi, IORb ₃ , I ₂ K ₄ O ₉ , I ₂ Th, InNTi ₂ , InNZr ₂ , InPt ₂ Y, InS ₂ Ta, InS ₂ Tl, InSe, In ₂ P ₂ Sr, KNbS ₂ , KNbSe ₂ , KPZn, KSbZn, KTL, K ₂ O ₄ S, K ₂ Te ₂ , K ₃ LaO ₉ Te ₂ , K ₃ LuO ₇ Si ₂ , K ₃ O ₇ ScSi ₂ , K ₃ P, K ₃ Sb, Kr, LiNbO ₂ , LiNbS ₂ , LiPSr, Li ₂ O ₂ , Li ₃ N, Li ₃ P, Li ₃ Sb, LuMg ₂ , Mg, Mg ₁₇ Sr ₂ , MgMoN ₂ , MgO, MgPo, MgTe, Mg ₄ Sr, MoS ₂ , MoSe ₂ , MoTe ₂ , NY, N ₂ SZr ₂ , N ₂ SeZr ₂ , N ₂ W, Na ₁₃ Pb ₅ , NaNbO ₂ , NaNbS ₂ , NaNbSe ₂ , NaS, Na ₂ O ₄ S, Na ₂ S ₂ , Na ₂ Se ₂ , Na ₃ P, Na ₃ Sb, O ₂ RbSc, O ₂ SSc ₂ , O ₂ Si, O ₄ Rb ₂ S, O ₄ STl ₂ , PbPt, PbS, PdSnU, PoZr, PtSn, Pt ₂ SnU, RbTe ₂ Y, Rb ₂ S, Rb ₂ Te, Rb ₃ Sb, Re ₂ Y, S ₂ ScTl, S ₂ Ti, S ₂ W, ScZn ₂ , Se ₂ W, SiSrZn, SiSr ₂ , SnTi ₂ , SnTi ₃ , TaZn ₂ , Te ₂ W, Xe, Zn,

Part 22 of all the predicted materials with band crossings from **Cases 1** or **2**:

195	I ₄ Sn, O ₂ Si,
196	Ge ₅ Li ₂₂ , Li ₂₂ Pb ₅ , Li ₂₂ Sn ₅ ,
197	Al ₆ Ca ₄ O ₁₆ S, Al ₆ O ₁₆ SSr ₄ , Al ₆ O ₁₆ Sr ₄ W, Bi ₁₂ GeO ₂₀ , Bi ₁₂ O ₂₀ Si, Bi ₁₂ O ₂₀ Ti, Bi ₂₄ O ₄₀ Pb ₂ , Bi ₂₄ O ₄₀ Si ₂ , Bi ₂₄ O ₄₀ Ti ₂ , Bi ₂ O ₃ , Cs ₁₈ O ₆ Tl ₈ , Li ₃ NbO ₄ ,
198	Ag ₃ NO ₃ S, Ag ₇ AsS ₆ , Ag ₇ AsSe ₆ , Ag ₇ PS ₆ , AlNaO ₄ Si, Al ₂ Ba ₃ O ₆ , AsClHg ₃ O ₄ , AsK ₃ S ₃ , AsK ₃ Se ₃ , AsNa ₃ S ₃ , AsNa ₃ Se ₃ , As ₄ Br ₆ Hg ₆ Sn, BKMgO ₃ , BMgO ₃ Rb, BaN ₂ O ₆ , Be ₃ Cd ₂ F ₁₂ Rb ₂ , BiCs ₃ O ₃ , BiCs ₃ Se ₃ , BiK ₂ RbSe ₃ , BiK ₃ Se ₃ , BiK ₃ Te ₃ , BiO ₃ Rb ₃ , BiRb ₃ Se ₃ , BrNaO ₃ , BrP ₇ Sr ₂ , Br ₆ Hg ₇ P ₄ Sn, CaNa ₂ O ₄ Si, ClF ₃ Sn ₂ , ClIn, ClNaO ₃ , Cl ₄ Hg ₃ O, Cl ₆ Hg ₆ P ₄ Pb, CsF ₇ Xe, Cs ₂ Mg ₂ O ₁₂ W ₃ , Cs ₃ O ₃ Sb, Cs ₃ S ₃ Sb, Cs ₃ SbSe ₃ , F ₄ LiSb, HfOS, HfO ₈ W ₂ , HgPd, IP ₇ Sr ₂ , K ₂ Mg ₂ O ₁₂ S ₃ , K ₂ O ₁₂ S ₃ Zn ₂ , K ₃ O ₃ Sb, K ₃ S ₃ Sb, K ₃ SbSe ₃ , K ₃ SbTe ₃ , MgPt, Mg ₂ Mo ₃ O ₁₂ Tl ₂ , Mg ₂ O ₁₂ Rb ₂ W ₃ , MoNa ₂ O ₆ Se, N ₁₁ Na ₃ P ₆ , N ₂ , Na ₃ S ₃ Sb, Na ₃ SbSe ₃ , Na ₃ SbTe ₃ , OSZr, O ₂ Si, O ₃ SrZr, O ₄ SnW, O ₈ W ₂ Zr, P ₂ Pb ₃ S ₈ , Rb ₃ S ₃ Sb, Rb ₃ SbSe ₃ , SbSe ₃ Tl ₃ , Te ₃ Tl ₂ Zr,
199	Al ₂ Ca ₃ F ₁₄ Na ₂ , Br ₂ Hg ₃ Te ₂ , Cl ₂ Hg ₃ S ₂ , Cl ₂ Hg ₃ Se ₂ , Cl ₂ Hg ₃ Te ₂ , F ₂ Hg ₃ S ₂ , In ₂ O ₃ , K ₂ O ₃ Pb ₂ , K ₂ O ₃ Sn ₂ , Lu ₂ O ₃ , N, O ₂ Si, O ₃ Sc ₂ , O ₃ Tl ₂ , O ₃ Y ₂ , Pb ₂ Pd ₃ S ₂ ,
200	AsBr ₃ Ca ₃ , CaO ₆ Ta ₂ , Cd ₁₁ Na ₂ , Cl ₇ Na, K ₆ MgNa ₁₄ Tl ₁₈ , K ₆ Na ₁₄ Tl ₁₈ Zn, LuNaO ₈ Pd ₆ , Mg ₂ Zn ₁₁ ,
201	BiKO ₃ , Br ₁₄ CdW ₆ , Br ₁₄ Mo ₆ Pb, C ₂ Ca, KO ₃ Sb,
203	AsRb ₃ Se ₁₆ , O ₂ Si,
204	Al ₁₂ Mo, Al ₁₂ W, BaGe ₁₂ Pt ₄ , C ₁₀ Cs, C ₈ , CaO ₁₂ Pd ₃ Ti ₄ , CaO ₃ Si, NPd ₃ , N ₂ O ₄ ,
205	AgPd ₃ Se, Ag ₂ As ₄ Hg ₇ I ₆ , AlF ₆ K ₂ Na, As ₂ Br ₃ Cd ₄ , As ₂ Br ₃ Hg ₄ , As ₂ Pd, As ₂ Pt, As ₄ BiCl ₇ Hg ₆ , As ₄ Br ₇ Hg ₆ In, As ₄ Cl ₇ Hg ₆ In, As ₄ Cl ₇ Hg ₆ Mo, Au ₃ CaGa, Au ₃ GeNa, Au ₃ NaSi, BaF ₇ Ta, BaGa ₂ S ₄ , Br ₇ Hg ₆ InSb ₄ , Br ₇ Hg ₆ Sb ₅ , Br ₉ In ₇ , CO ₂ , C ₂ Si, C ₆₀ , CdO ₂ , CdS ₂ , CdSe ₂ , Cd ₇ Cl ₆ P ₄ , Cl ₁₂ I ₂ Nb ₆ , Cl ₉ In ₇ , CsF ₇ W, CsO ₆ Se ₂ Y, F ₂ Mg, F ₆ NaSb, Ga ₄ GeS ₄ , GeI ₄ , GeO ₂ , GeO ₆ Se ₂ , Ge ₈ NaRb ₇ , HfN ₂ , I ₄ Sn, In ₄ S ₄ Sn, K ₇ LiSi ₈ , Li ₇ N ₄ Nb, MgO ₂ , MgSe ₂ , MgTe ₂ , N ₂ , N ₂ Pd, N ₂ Pt, N ₂ W, NaRb ₇ Si ₈ , O ₂ Pt, O ₂ Sn, O ₂ Sn, O ₂ U, O ₆ Se ₂ Sn, O ₇ P ₂ Si, P ₂ Pt, P ₂ Si, PdSb ₂ , PtSb ₂ , S ₂ Ti, S ₂ Zn, Se ₂ Zn,
206	AgF ₆ Sb, AlLi ₃ N ₂ , As ₂ Mg ₃ , Be ₃ N ₂ , Be ₃ P ₂ , BiF ₆ K, Bi ₂ O ₃ , C, Ca ₃ N ₂ , Cd ₃ N ₂ , Cd ₃ P ₂ , F ₆ KSb, GaLi ₃ N ₂ , HfO ₈ Te ₃ , In ₂ O ₃ , La ₂ O ₃ , Li ₃ N ₂ Sc, Lu ₂ O ₃ , Mg ₃ N ₂ , Mg ₃ P ₂ , Mg ₃ Sb ₂ , N ₂ Zn ₃ , O ₂ Si, O ₃ Sc ₂ , O ₃ Tl ₂ , O ₃ Y ₂ , O ₈ SnTe ₃ , O ₈ Te ₃ Ti, O ₈ Te ₃ Zr, P ₂ Zn ₃ ,
212	Bi ₂ K ₃ N ₉ O ₂₇ , O ₈ Ti ₃ Zn ₂ ,
213	Ag ₄ S ₈ Sn ₃ , Be ₂ CsF ₅ , CaI ₂ Mo ₃ , Cs ₃ N ₁₁ P ₆ , K ₃ N ₁₁ P ₆ , N ₁₁ P ₆ Rb ₃ , Si ₂ Sr,
214	Ag ₃ AuSe ₂ , Ag ₃ AuTe ₂ , AsI ₃ La ₃ , BBa ₂ ClN ₂ , Ca ₃ I ₃ P, Ca ₃ O ₁₂ Te ₂ Zn ₃ , I ₃ La ₃ P, I ₃ La ₃ Sb,
215	Au ₉ In ₄ , Be ₄ Na ₁₀ O ₁₇ Si ₄ , BiF ₃ , BiMg ₆₃ Si ₃₂ , C ₈ S ₄ O ₄ , CK ₄ O ₄ , CLi ₄ O ₄ , CNa ₄ O ₄ , C ₂ N ₂ Zn, C ₃ N ₂ , C ₃ N ₄ , C ₄ BLiN ₄ , In ₅ Ti ₈ , Li ₂ MgSi,

Part 23 of all the predicted materials with band crossings from **Cases 1** or **2**:

216	AgI, AgKO, AgN, AgNaO, AgORb, AlAs, AlBBE, AlGeLi, AlLiSi, AlN, AlP, AlSb, Al ₄ La ₁₇ N ₃₃ Si ₉ , AsB, AsGa, AsLiMg, AsLiZn, Au ₁₀ Mo ₄ Zn ₈₉ , AuGaLi ₂ , AuLi ₂ Tl, AuLuSn, AuScSn, B ₁₁ Li, BN, BP, BSb, BaO ₄ S, Ba ₃ In ₂ O ₁₁ Zn ₅ , Ba ₃ Lu ₂ O ₁₁ Zn ₅ , Be ₁₇ Ca ₁₂ O ₂₉ , BeO, BePo, BeS, BeTe, Be ₄ O ₇ Te, Be ₅ Pd, Be ₅ Pt, BrMoS, C, CGe, CHf, CPT, CSi, CSn, CZr, Ca ₁₆ N ₃₄ Si ₁₇ , CaSe, CdLiP, CdS, CdSe, CdTe, Cd ₄₅ Y ₁₁ , ClCsO ₄ , ClKO ₄ , ClNaO ₄ , ClO ₄ Rb, ClO ₄ Tl, CsLiMoO ₄ , GaLiSi, GaN, GaP, GeLi ₂ Sn, GeLi ₂ Zn, GePtTi, GeTi ₂ , HfPdSn, HfPtSn, HgS, Hg ₄₅ U ₁₁ , InLaPt ₄ , InN, InP, K ₃ Sb, LiMgP, LiNZn, LiPZn, Li ₂₁ Si ₅ , MgS, MgSe, MgTe, NRe, NSc, NTa, NTL, NY, OZn, O ₄ SSr, O ₄ SZn, PSc, Pd ₁₇ Te ₄ , PdSbSc, PdSnZr, Pd ₄ Te, PtSbSc, PtSbY, PtSnTh, PtSnTi, PtSnU, Pt ₅ U, Re ₄ S ₄ Te ₄ , SSn, SZn, SeZn, Si, SiSn, SnTe, SnTi ₂ , TeZn,
217	Ag ₃ Ge ₃ P ₆ Sn ₂ , Ag ₃ P ₆ Si ₃ Sn ₂ , Al ₁₂ Ca ₈ O ₂₄ S ₂ , Al ₁₂ Ca ₈ O ₂₄ Te ₂ , Al ₁₂ Cd ₈ O ₂₄ S ₂ , Al ₁₂ Cd ₈ O ₂₄ Te ₂ , Al ₁₂ O ₂₄ S ₂ Sr ₈ , Al ₁₂ O ₂₄ Sr ₈ Te ₂ , Al ₆ Ca ₄ O ₁₃ , Al ₆ Ca ₄ O ₁₆ W, B ₁₂ O ₂₄ Se ₂ Zn ₈ , BiK ₃ O ₃ , BiNa ₃ O ₃ , CaNa ₁₀ Sn ₁₂ , Cd ₄ N ₁₂ P ₆ S, F ₄ Ge, F ₄ Si, K ₃ S ₄ Sb, Li ₃ NbO ₄ , Mg ₄ N ₁₂ P ₆ S, N ₁₂ P ₆ SZn ₄ , N ₂ , N ₂₄ O ₂ P ₁₂ Zn ₈ , Na ₁₀ Sn ₁₂ Sr, Na ₃ O ₃ Sb, Na ₃ PSe ₄ , Na ₃ S ₄ Sb, Na ₃ SbSe ₄ , NbS ₄ Tl ₃ , NbSe ₄ Tl ₃ , Nb ₃ Sb ₂ Te ₅ , O ₂ Si, S ₄ TaTl ₃ , Se ₄ TaTl ₃ , Si,
218	Ag ₃ AsO ₄ , Al ₆ Br ₂ Ge ₆ Li ₈ O ₂₄ , Al ₆ Br ₂ Ge ₆ Na ₈ O ₂₄ , Al ₆ Cl ₂ Ge ₆ Na ₈ O ₂₄ , Al ₆ Cl ₂ K ₈ O ₂₄ Si ₆ , Al ₆ Cl ₂ Na ₈ O ₂₄ Si ₆ , Al ₆ Ge ₆ L ₂ Li ₈ O ₂₄ , Al ₆ Ge ₆ L ₂ Na ₈ O ₂₄ , Al ₆ I ₂ Na ₈ O ₂₄ Si ₆ , As ₃ Be ₃ ClLi ₄ O ₁₂ , As ₄ Ba ₄ Ge, As ₄ Ba ₄ Si, As ₄ Ba ₄ Ti, As ₄ Sr ₄ Ti, As ₈ Ge ₃₈ I ₈ , Ba ₄ P ₄ Si, BeCl ₂ , BeF ₂ , Be ₆ Cd ₈ O ₂₄ S ₂ Si ₆ , Be ₆ Cd ₈ O ₂₄ Se ₂ Si ₆ , Be ₆ O ₂₄ S ₂ Si ₆ Zn ₈ , Br ₂ Ga ₆ Li ₈ O ₂₄ Si ₆ , Br ₂ Ga ₆ Na ₈ O ₂₄ Si ₆ , Br ₈ Ge ₃₈ P ₈ , Cl ₂ Ga ₆ Li ₈ O ₂₄ Si ₆ , Cl ₄ Se, CsSi, Cs ₄ Ge ₄ , Cs ₄ Se ₄ Si, Cs ₈ Sn ₈ , Ga ₆ L ₂ Li ₈ O ₂₄ Si ₆ , GeK, GeK ₄ Se ₄ , GeRb, Ge ₃₈ I ₈ P ₈ , Ge ₄ K ₄ , Ge ₄ Rb ₄ , KSi, K ₄ Si ₄ , P ₄ Sr ₄ Ti, RbSi, Rb ₄ S ₄ Sn, Rb ₄ Si ₄ ,
219	Cl ₁₆ Ge ₆ , Cl ₁₆ Si ₆ ,
220	Ag ₃ F ₂₄ Sb ₄ , Al ₁₄ Ca ₁₂ O ₃₂ , AlO ₉ P ₃ , Au ₃ La ₃ Sb ₄ , Bi ₄ Ge ₃ O ₁₂ , Bi ₄ O ₁₂ Si ₃ , C ₈ Ag ₄ Cs ₅ IN ₈ , Ca ₁₂ Li ₆ MO ₄ N ₁₆ O ₃ ,
221	AgF ₃ Zn, AgGa, AgI, AgIn, AgLi, AgNbO ₃ , AlAu, AlBiO ₃ , AlF ₃ , AlLaO ₃ , AlSc, AlY, AsCa ₃ Cl ₃ , AsCa ₃ N, AuCs, B ₆ Ba, B ₆ Ca, B ₆ Si, B ₆ Sr, BaF ₃ Li, BaO ₃ Sn, BaO ₃ Ti, BaO ₃ Zr, BaSe, BaTe, BeCsF ₃ , BeTi, BiCa ₃ N, BiGaO ₃ , BiInO ₃ , BiK ₉ O ₂₄ U ₆ , BiNSr ₃ , BiO ₃ Sc, BrCs, BrK, BrLi ₃ O, BrRb, BrTl, Br ₃ CaCs, Br ₃ CdCs, Br ₃ CsGe, Br ₃ CsPb, CPbPd ₃ , CPt ₃ Sn, CTh, C ₃ N ₂ , C ₃ Nb ₄ , CaCsF ₃ , CaF ₃ Li, CaF ₃ Rb, CaO ₃ Si, CaO ₃ Sn, CaO ₃ Ti, CaPd, Ca ₃ Cl ₃ P, Ca ₃ GeO, Ca ₃ NP, Ca ₃ OPb, Ca ₃ OSn, CdCl ₃ Cs, CdCsF ₃ , CdF ₃ K, CdF ₃ Rb, ClCs, ClK, ClNa, ClNa ₃ O, ClRb, ClTi, Cl ₃ CsHg, Cl ₃ CsPb, Cl ₃ CsSn, CsF ₃ Hg, CsF ₃ Pb, CsF ₃ Sr, CsI, CsI ₃ Pb, CsI ₃ Sn, F ₃ HgRb, F ₃ KMg, F ₃ KZn, F ₃ MgNa, F ₃ MgRb, F ₃ Mg ₃ N, F ₃ Sc, F ₃ Y, GeI ₃ Rb, GeO ₃ Pb, GeO ₃ Sr, HfO ₃ Pb, HfO ₃ Sr, HfPd ₃ , HgMg, HgPt ₃ , HgTi ₃ , IK, IRb, ITl, KNbO ₃ , KO ₃ Ta, LaN, LiTl, Li ₉ NS ₃ , MgO, MgPd, NSbSr ₃ , NTi ₃ Tl, NY, N ₃ TaTh, NaNbO ₃ , NaO ₃ Ta, OSnSr ₃ , OSr, OZn, O ₃ PbTi, O ₃ PbZr, O ₃ SiSr, O ₃ SnSr, O ₃ SnTi, O ₃ SrTi, O ₃ SrZr,

Part 24 of all the predicted materials with band crossings from **Cases 1** or **2**:

221	O ₃ U, O ₃ W, PbPt ₃ , PbS, PbSe, PbTe, Pt ₃ Sn, Pt ₃ Zn, SSr, SiU ₃ , SnTe, Sn ₃ U,
223	BiNb ₃ , C ₆₀ Ba ₃ , Cl ₂ Hg ₃ S ₂ , HgTi ₃ , HgZr ₃ , MgO, Nb ₃ Sb, SbTa ₃ , SbTa ₃ , Si, Si ₄₆ ,
224	Al ₃ LuO ₈ Pb ₂ , Au ₂ S, C ₂ N ₄ Si, Mg ₃ P ₂ , O ₂ Si,
225	AgBr, AgCl, AgI, Ag ₂ MgZn, Al ₁₆ Pt ₇ Zr ₆ , AlAu ₂ Sc, AlF ₆ K ₂ Li, AlF ₆ K ₂ Na, AlF ₆ K ₃ , AlF ₆ NaRb ₂ , AlN, Al ₂ O, Al ₄ In ₃ Sr ₁₁ , AsF ₆ Na, AsLu, AsNa ₃ , AsSc, AsY, AuLi ₃ , Au ₂ Cl ₆ Cs ₂ , Au ₂ InLu, Au ₂ InSc, Au ₂ InY, B ₁₂ Hf, B ₁₂ Th, Ba, BaBiO ₃ , BaO, BaPo, BaS, BaSe, BaTe, Ba ₂ Bi ₂ O ₆ , Ba ₂ CaMoO ₆ , Ba ₂ CaO ₆ Te, Ba ₂ CaO ₆ W, Ba ₂ CdO ₆ U, Ba ₂ INaO ₆ , Ba ₂ InNbO ₆ , Ba ₂ InO ₆ Ta, Ba ₂ LiO ₆ Re, Ba ₂ LuNbO ₆ , Ba ₂ LuO ₆ Sb, Ba ₂ LuO ₆ Ta, Ba ₂ MgO ₆ Te, Ba ₂ MgO ₆ U, Ba ₂ MgO ₆ W, Ba ₂ NaO ₆ Re, Ba ₂ NbO ₆ Y, Ba ₂ O ₆ PbU, Ba ₂ O ₆ SbY, Ba ₂ O ₆ SrU, Ba ₂ O ₆ TaY, Ba ₂ O ₆ TeZn, Ba ₂ O ₆ UZn, Ba ₂ O ₆ WZn, Ba ₃ O ₆ W, BeO, BeSe, BiCl ₆ Cs ₂ Na, BiCs ₂ F ₆ K, BiCs ₂ F ₆ Na, BiCs ₂ F ₆ Rb, BiCs ₃ , BiF ₃ , BiF ₆ KRb ₂ , BiF ₆ NaRb ₂ , BiI ₃ , BiLa, BiLi ₃ , BiLu, BiRb ₃ , BiSc, BiY, BrCs, BrK, BrLi, BrNa, BrRb, BrTl, Br ₆ Cs ₂ LaNa, Br ₆ Cs ₂ NaY, Br ₆ Cs ₂ Po, Br ₆ Cs ₂ Pt, Br ₆ Cs ₂ Sn, Br ₆ Cs ₂ Te, Br ₆ Cs ₂ U, Br ₆ K ₂ Pt, Br ₆ K ₂ Se, Br ₆ K ₂ Sn, Br ₆ K ₂ Te, Br ₆ PdRb ₂ , Br ₆ Rb ₂ Sn, Br ₆ Rb ₂ Te, Br ₆ Rb ₂ U, Br ₈ Li ₆ Mg, CBe ₂ , CGe, CPd, CPt, CSi, CSn, CW, CZr, Ca, Ca ₁₁ Ga ₇ , CaF ₂ , CaF ₆ Pb, CaF ₆ Sn, CaMoO ₆ Sr ₂ , CaO, CaO ₃ Sn, CaO ₆ Sr ₂ W, CaPo, CaS, CaSe, CaTe, Ca ₂ Ge, Ca ₂ O ₆ SiTi, Ca ₂ Pb, Ca ₂ Si, Ca ₂ Sn, Ca ₃ Cd ₈ Pt ₄ , Ca ₇ Ge, CdCl ₈ Na ₆ , CdF ₂ , CdO, CdO ₆ Sr ₂ W, CdS, CdSe, CdTe, ClCs, ClK, ClNa, ClRb, ClTi, Cl ₂ Sr, Cl ₆ Cs ₂ Ge, Cl ₆ Cs ₂ KSc, Cl ₆ Cs ₂ LiLu, Cl ₆ Cs ₂ LiY, Cl ₆ Cs ₂ NaY, Cl ₆ Cs ₂ Pb, Cl ₆ Cs ₂ Pt, Cl ₆ Cs ₂ Se, Cl ₆ Cs ₂ Sn, Cl ₆ Cs ₂ Te, Cl ₆ Cs ₂ Ti, Cl ₆ Cs ₂ Zr, Cl ₆ K ₂ Pd, Cl ₆ K ₂ Pt, Cl ₆ K ₂ Sn, Cl ₆ K ₂ Ti, Cl ₆ PbRb ₂ , Cl ₆ PtRb ₂ , Cl ₆ PtTl ₂ , Cl ₆ Rb ₂ Se, Cl ₆ Rb ₂ Sn, Cl ₆ Rb ₂ Te, Cl ₆ Rb ₂ Ti, Cl ₆ Rb ₂ Zr, Cl ₆ SnTl ₂ , Cl ₆ TeTl ₂ , CsF ₃ Tl, CsI, CsK ₂ Sb, Cs ₂ F ₆ Ge, Cs ₂ F ₆ InNa, Cs ₂ F ₆ KY, Cs ₂ F ₆ NaSc, Cs ₂ F ₆ NaTl, Cs ₂ F ₆ NaY, Cs ₂ F ₆ Pd, Cs ₂ F ₆ Pt, Cs ₂ F ₆ RbY, Cs ₂ F ₆ Si, Cs ₂ HfI ₆ , Cs ₂ I ₆ Pd, Cs ₂ I ₆ Po, Cs ₂ I ₆ Pt, Cs ₂ I ₆ Sn, Cs ₂ I ₆ Te, Cs ₃ Sb, Cs ₆ I ₈ Re ₆ S ₈ , F ₁₀ KY ₃ , F ₂ Hg, F ₂ Pb, F ₂ Ra, F ₂ Te, F ₃ La, F ₆ GaKRb ₂ , F ₆ GeRb ₂ , F ₆ HfK ₂ , F ₆ InKRb ₂ , F ₆ InK ₂ Na, F ₆ K ₂ NaSc, F ₆ K ₂ NaTl, F ₆ K ₂ NaY, F ₆ K ₂ Si, F ₆ NaRb ₂ Y, F ₆ NaSb, F ₆ O ₄ PbZr ₃ , F ₆ PdRb ₂ , F ₆ Rb ₂ Si, F ₆ SiTl ₂ , F ₆ Sn ₂ , GaLiMg ₂ , GaN, GaO ₆ SbSr ₂ , Ga ₂ In ₆ O ₈ Pt, Ga ₄ In ₃ Sr ₁₁ , Ge, GeMg ₂ , GeTe, GeTh, Ge ₂ In ₆ O ₉ Pt, He, HfO ₂ , HgP ₂ Si, HgS, IK, ILi, IRb, ITl, I ₆ PdRb ₂ , I ₆ Rb ₂ Sn, InN, InO ₆ Sr ₂ Ta, In ₇ Sr ₁₁ , KNa ₂ Sb, LaP, LaSb, LiMg ₂ Tl, Li ₂ MgSi, Li ₂ NaSb, Li ₂ O, Li ₂ S, Li ₂ Se, Li ₂ Te, Li ₃ Sb, Li ₄ N ₂ Na ₂ , LuN, LuSb, MgO, MgO ₆ Pb ₂ Te, MgO ₆ Pb ₂ W, MgO ₆ Sr ₂ W, MgS, MgSe, MgTe, Mg ₂ Si, Mg ₂ Sn, MoO ₆ Sr ₂ Zn, NPa, NSc, N ₂ Pd, Na ₂ S, Na ₂ Se, Na ₂ Te, Na ₆ O ₉ S ₂ , OSr, OZn, O ₂ Si, O ₂ Sn, O ₂ Ti, O ₂ U, O ₂ Zr, O ₄ Pd ₃ Tl, O ₆ SbSr ₂ Y, O ₆ Sr ₂ TaY, O ₆ Sr ₂ WZn, PSc, Pb, PbPo, PbS, PbSe, PbTe, PoSr, RaS, RaSe, Rb ₂ S, Rb ₂ Se, Rb ₂ Te, Rn, SSn, SSr,

Part 25 of all the predicted materials with band crossings from **Cases 1** or **2**:

225	SbSc, SbY, SeSn, SeSr, SeU, SnTe, SrTe, TeU, TeZn, W, Xe, Y ₆ Zn ₂₃ ,
227	AgO ₃ Sb, Ag ₂ MoO ₄ , Ag ₂ O ₆ Sb ₂ , Ag ₃ NaS ₂ , Ag ₆ K ₂ S ₄ , Al ₁₈ Mg ₃ Mo ₂ , Al ₁₈ Mg ₃ W ₂ , AlCsO ₂ , AlLi, AlO ₂ Rb, Al ₂ Ba, Al ₂ Ca, Al ₂ CdO ₄ , Al ₂ CdSe ₄ , Al ₂ ClF ₂₅ Sr ₁₀ , Al ₂ O ₄ Zn, Al ₂ Se ₄ Zn, Al ₂ Sr, Al ₂ Th, As ₂ O ₃ , As ₄ He ₂ O ₆ , As ₄ Na ₈ Ti, As ₄ O ₆ , BLi, Ba ₂₁ O ₅ Si ₂ , Ba ₂ Ge ₄ S ₁₀ , Be ₂ Ti, Bi ₂ O ₃ , Bi ₂ O ₇ Pt ₂ , Bi ₂ O ₇ Sn ₂ , Bi ₂ O ₇ Ti ₂ , CBr ₃ LiN ₂ Sr ₂ , CNb ₄ Zn ₂ , CTi, CTi ₂ , C ₃ N ₄ , C ₃ Nb ₈ Zn ₄ , C ₄ F ₁₂ Ge ₄ S ₆ , Ca ₂ Nb ₂ O ₇ , Ca ₂ O ₇ Sb ₂ , Ca ₂ O ₇ Ta ₂ , CdGa ₂ O ₄ , CdIn ₂ O ₄ , CdIn ₂ S ₄ , CdIn ₂ Se ₄ , CdLu ₂ S ₄ , CdLu ₂ Se ₄ , CdS ₄ Sc ₂ , CdS ₄ Y ₂ , CdSc ₂ Se ₄ , CdSe ₄ Y ₂ , Cd ₂ Nb ₂ O ₇ , Cd ₂ O ₄ Si, Cd ₂ O ₄ Sn, Cd ₂ O ₇ Re ₂ , Cd ₂ O ₇ Ta ₂ , Cl ₄ Li ₂ Zn, CsN ₂ Nb, F ₆ Hg ₂ OZn ₂ , GaLi, Ga ₂ MgO ₄ , Ga ₂ O ₄ Zn, Ge ₁₃₆ , GeMg ₂ , GeMg ₂ O ₄ , Ge ₃ N ₄ , HfZn ₂ , Hf ₂ La ₂ O ₇ , Hf ₂ O ₇ Y ₂ , Hf ₂ Pd, Hf ₃ NZn ₃ , HgIn ₂ S ₄ , Hg ₂ Nb ₂ O ₇ , Hg ₂ O ₇ Sb ₂ , In ₂ Mg, In ₂ MgO ₄ , In ₂ O ₇ Si ₂ , In ₂ S ₄ Zn, In ₃ Li ₁₃ , KO ₃ Sb, K ₈ Sb ₄ Sn, La ₂ O ₇ Sn ₂ , La ₂ O ₇ Zr ₂ , Lu ₂ MgS ₄ , Lu ₂ MgSe ₄ , Lu ₂ O ₇ Sn ₂ , Lu ₂ O ₇ Ti ₂ , MgS ₄ Sc ₂ , MgSc ₂ Se ₄ , MgSe ₄ Y ₂ , Mg ₂ O ₄ Si, Mg ₂ O ₄ Sn, Mg ₂ Si, Mg ₂ Sn, Mg ₂ Th, MoNa ₂ O ₄ , Mo ₂ O ₇ Y ₂ , NPd ₂ Zr ₄ , N ₄ Si ₃ , N ₄ Sn ₃ , NaTl, Na ₂ O ₄ W, Nb ₂ O ₇ Sn ₂ , O ₃ Sb ₂ , O ₄ SiZn ₂ , O ₄ SnZn ₂ , O ₆ Sb ₄ , O ₇ Sc ₂ Si ₂ , O ₇ Sn ₂ Ta ₂ , O ₇ Sn ₂ Y ₂ , O ₇ Ti ₂ Y ₂ , Pd ₁₃ Te ₃ , S ₂ Sn, S ₂ Ti, S ₄ Sc ₂ Zn, S ₄ Y ₂ Zn, Se, Si ₁₃₆ , Zn ₂ Zr, B ₃ Ba ₄ N ₆ Na, Ba ₂ K ₈ O ₂₄ U ₆ , Ba ₄ NaO ₁₂ Sb ₃ , Be, CaK ₄ O ₁₂ U ₃ , Ca ₂ K ₈ O ₂₄ U ₆ , F ₆ Mo, F ₆ S, Ge, He, Hg ₄ Pt, K ₈ O ₂₄ Sr ₂ U ₆ ,
229	B ₃ Ba ₄ N ₆ Na, Ba ₂ K ₈ O ₂₄ U ₆ , Ba ₄ NaO ₁₂ Sb ₃ , Be, CaK ₄ O ₁₂ U ₃ , Ca ₂ K ₈ O ₂₄ U ₆ , F ₆ Mo, F ₆ S, Ge, He, Hg ₄ Pt, K ₈ O ₂₄ Sr ₂ U ₆ ,
230	Al ₂ Cd ₃ O ₁₂ Si ₃ , Al ₂ F ₁₂ Li ₃ Na ₃ , Al ₅ O ₁₂ Y ₃ , Al ₅ O ₁₂ Y ₃ , B ₃ Ba ₄ NaO ₉ , Bi ₆ BrKO ₉ , Ca ₃ Ga ₂ Ge ₃ O ₁₂ , Ca ₃ Ga ₂ O ₁₂ Si ₃ , Ca ₃ Ge ₃ O ₁₂ Sc ₂ , Cd ₃ Ge ₃ O ₁₂ Sc ₂ , Ga ₃ Na ₃ O ₁₂ Te ₂ , Ga ₅ O ₁₂ Y ₃ , Ge ₃ O ₁₂ Sr ₃ Y ₂ , Hg ₃ O ₆ Te, O ₂ Si, O ₂ Si,

V. AI BASIS VECTORS FOR 230 SPACE GROUPS

$$\begin{pmatrix} \text{SG1} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{X,1} & 1 \\ n_{Y,1} & 1 \\ n_{Z,1} & 1 \\ n_{U,1} & 1 \\ n_{T,1} & 1 \\ n_{S,1} & 1 \\ n_{R,1} & 1 \end{pmatrix} \quad (2)$$

$$\begin{pmatrix} \text{SG2} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 \\ \nu & 4 & 2 & 2 & 2 & 2 & -4 & -4 & -4 & 8 \\ n_{\Gamma,1} & 1 & 1 & 1 & 1 & 1 & -2 & -2 & -2 & 4 \\ n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{X,1} & 1 & 1 & 0 & 1 & 0 & -2 & -2 & 0 & 4 \\ n_{X,2} & 1 & 0 & 1 & 0 & 1 & 0 & 0 & -2 & 0 \\ n_{Y,1} & 1 & 1 & 0 & 0 & 1 & -2 & 0 & -2 & 4 \\ n_{Y,2} & 1 & 0 & 1 & 1 & 0 & 0 & -2 & 0 & 0 \\ n_{Z,1} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{Z,2} & 1 & 0 & 1 & 1 & 1 & -2 & -2 & -2 & 4 \\ n_{U,1} & 1 & 1 & 1 & 0 & 0 & 0 & -2 & -2 & 4 \\ n_{U,2} & 1 & 0 & 0 & 1 & 1 & -2 & 0 & 0 & 0 \\ n_{T,1} & 1 & 1 & 1 & 1 & 0 & -2 & -2 & -2 & 4 \\ n_{T,2} & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ n_{S,1} & 1 & 1 & 1 & 0 & 1 & -2 & -2 & -2 & 4 \\ n_{S,2} & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{R,1} & 1 & 1 & 0 & 1 & 1 & -2 & -2 & -2 & 4 \\ n_{R,2} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix} \tag{3}$$

$$\begin{pmatrix} \text{SG3} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{B,1} & 1 \\ n_{B,2} & 1 \\ n_{Y,1} & 1 \\ n_{Y,2} & 1 \\ n_{Z,1} & 1 \\ n_{Z,2} & 1 \\ n_{C,1} & 1 \\ n_{C,2} & 1 \\ n_{D,1} & 1 \\ n_{D,2} & 1 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{E,1} & 1 \\ n_{E,2} & 1 \end{pmatrix} \tag{4}$$

$$\begin{pmatrix} \text{SG4} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\text{B},1} & 2 \\ n_{\text{B},2} & 2 \\ n_{\text{Y},1} & 2 \\ n_{\text{Y},2} & 2 \\ n_{\text{Z},1} & 1 \\ n_{\text{Z},2} & 1 \\ n_{\text{C},1} & 1 \\ n_{\text{C},2} & 1 \\ n_{\text{D},1} & 1 \\ n_{\text{D},2} & 1 \\ n_{\text{A},1} & 2 \\ n_{\text{A},2} & 2 \\ n_{\text{E},1} & 1 \\ n_{\text{E},2} & 1 \end{pmatrix} \quad (5)$$

$$\begin{pmatrix} \text{SG5} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\text{A},1} & 1 \\ n_{\text{A},2} & 1 \\ n_{\text{Z},1} & 1 \\ n_{\text{Z},2} & 1 \\ n_{\text{M},1} & 1 \\ n_{\text{M},2} & 1 \\ n_{\text{L},1} & 1 \\ n_{\text{V},1} & 1 \end{pmatrix} \quad (6)$$

$$\begin{pmatrix} \text{SG6} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\text{B},1} & 1 \\ n_{\text{B},2} & 1 \\ n_{\text{Y},1} & 1 \\ n_{\text{Y},2} & 1 \\ n_{\text{Z},1} & 1 \\ n_{\text{Z},2} & 1 \\ n_{\text{C},1} & 1 \\ n_{\text{C},2} & 1 \\ n_{\text{D},1} & 1 \\ n_{\text{D},2} & 1 \\ n_{\text{A},1} & 1 \\ n_{\text{A},2} & 1 \\ n_{\text{E},1} & 1 \\ n_{\text{E},2} & 1 \end{pmatrix} \quad (7)$$

$$\begin{pmatrix} \text{SG7} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\text{B},1} & 1 \\ n_{\text{B},2} & 1 \\ n_{\text{Y},1} & 2 \\ n_{\text{Y},2} & 2 \\ n_{\text{Z},1} & 2 \\ n_{\text{Z},2} & 2 \\ n_{\text{C},1} & 2 \\ n_{\text{C},2} & 2 \\ n_{\text{D},1} & 1 \\ n_{\text{D},2} & 1 \\ n_{\text{A},1} & 1 \\ n_{\text{A},2} & 1 \\ n_{\text{E},1} & 1 \\ n_{\text{E},2} & 1 \end{pmatrix} \tag{8}$$

$$\begin{pmatrix} \text{SG8} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\text{A},1} & 1 \\ n_{\text{A},2} & 1 \\ n_{\text{Z},1} & 1 \\ n_{\text{Z},2} & 1 \\ n_{\text{M},1} & 1 \\ n_{\text{M},2} & 1 \\ n_{\text{L},1} & 1 \\ n_{\text{V},1} & 1 \end{pmatrix} \tag{9}$$

$$\begin{pmatrix} \text{SG9} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\text{A},1} & 1 \\ n_{\text{A},2} & 1 \\ n_{\text{Z},1} & 2 \\ n_{\text{Z},2} & 2 \\ n_{\text{M},1} & 1 \\ n_{\text{M},2} & 1 \\ n_{\text{L},1} & 2 \\ n_{\text{V},1} & 2 \end{pmatrix} \tag{10}$$

$$\begin{pmatrix}
 \text{SG10} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 \\
 \nu & 4 & 2 & 2 & 2 & 2 & -4 & -4 & -4 & 8 \\
 n_{\Gamma,1} & 1 & 1 & 1 & 1 & 1 & -2 & -2 & -2 & 4 \\
 n_{\Gamma,2} & 1 & 1 & 1 & 1 & 1 & -2 & -2 & -2 & 4 \\
 n_{\Gamma,3} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{B,1} & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\
 n_{B,2} & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\
 n_{B,3} & 1 & 1 & 1 & 1 & 0 & -2 & -2 & -2 & 4 \\
 n_{B,4} & 1 & 1 & 1 & 1 & 0 & -2 & -2 & -2 & 4 \\
 n_{Y,1} & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{Y,2} & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{Y,3} & 1 & 1 & 1 & 0 & 1 & -2 & -2 & -2 & 4 \\
 n_{Y,4} & 1 & 1 & 1 & 0 & 1 & -2 & -2 & -2 & 4 \\
 n_{Z,1} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{Z,2} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{Z,3} & 1 & 1 & 0 & 1 & 1 & -2 & -2 & -2 & 4 \\
 n_{Z,4} & 1 & 1 & 0 & 1 & 1 & -2 & -2 & -2 & 4 \\
 n_{C,1} & 1 & 1 & 0 & 0 & 1 & -2 & 0 & -2 & 4 \\
 n_{C,2} & 1 & 1 & 0 & 0 & 1 & -2 & 0 & -2 & 4 \\
 n_{C,3} & 1 & 0 & 1 & 1 & 0 & 0 & -2 & 0 & 0 \\
 n_{C,4} & 1 & 0 & 1 & 1 & 0 & 0 & -2 & 0 & 0 \\
 n_{D,1} & 1 & 1 & 0 & 1 & 0 & 0 & -2 & -2 & 4 \\
 n_{D,2} & 1 & 1 & 0 & 1 & 0 & 0 & -2 & -2 & 4 \\
 n_{D,3} & 1 & 0 & 1 & 0 & 1 & -2 & 0 & 0 & 0 \\
 n_{D,4} & 1 & 0 & 1 & 0 & 1 & -2 & 0 & 0 & 0 \\
 n_{A,1} & 1 & 1 & 1 & 0 & 0 & -2 & -2 & 0 & 4 \\
 n_{A,2} & 1 & 1 & 1 & 0 & 0 & -2 & -2 & 0 & 4 \\
 n_{A,3} & 1 & 0 & 0 & 1 & 1 & 0 & 0 & -2 & 0 \\
 n_{A,4} & 1 & 0 & 0 & 1 & 1 & 0 & 0 & -2 & 0 \\
 n_{E,1} & 1 & 0 & 1 & 1 & 1 & -2 & -2 & -2 & 4 \\
 n_{E,2} & 1 & 0 & 1 & 1 & 1 & -2 & -2 & -2 & 4 \\
 n_{E,3} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{E,4} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0
 \end{pmatrix}$$

(11)

$$\begin{pmatrix}
 \text{SG11} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 4 & 4 & 0 & 0 & 0 \\
 n_{\Gamma,1} & 1 & 2 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 2 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 \\
 n_{\text{B},1} & 1 & 0 & 0 & 2 & 0 \\
 n_{\text{B},2} & 1 & 0 & 0 & 2 & 0 \\
 n_{\text{B},3} & 1 & 2 & 0 & -2 & 0 \\
 n_{\text{B},4} & 1 & 2 & 0 & -2 & 0 \\
 n_{\text{Y},1} & 1 & 0 & 2 & 0 & 0 \\
 n_{\text{Y},2} & 1 & 0 & 2 & 0 & 0 \\
 n_{\text{Y},3} & 1 & 2 & -2 & 0 & 0 \\
 n_{\text{Y},4} & 1 & 2 & -2 & 0 & 0 \\
 n_{\text{Z},1} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{C},1} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{D},1} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{A},1} & 1 & 2 & -2 & -2 & 4 \\
 n_{\text{A},2} & 1 & 2 & -2 & -2 & 4 \\
 n_{\text{A},3} & 1 & 0 & 2 & 2 & -4 \\
 n_{\text{A},4} & 1 & 0 & 2 & 2 & -4 \\
 n_{\text{E},1} & 1 & 1 & 0 & 0 & 0
 \end{pmatrix} \tag{12}$$

$$\begin{pmatrix}
 \text{SG12} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 \\
 \nu & 4 & 4 & -8 & 2 & -4 & 8 & -8 \\
 n_{\Gamma,1} & 1 & 2 & -4 & 1 & -2 & 4 & -4 \\
 n_{\Gamma,2} & 1 & 2 & -4 & 1 & -2 & 4 & -4 \\
 n_{\Gamma,3} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\text{A},1} & 1 & 0 & -1 & 0 & 0 & 2 & -4 \\
 n_{\text{A},2} & 1 & 0 & -1 & 0 & 0 & 2 & -4 \\
 n_{\text{A},3} & 1 & 2 & -3 & 1 & -2 & 2 & 0 \\
 n_{\text{A},4} & 1 & 2 & -3 & 1 & -2 & 2 & 0 \\
 n_{\text{Z},1} & 1 & 0 & -2 & 1 & 0 & 2 & -4 \\
 n_{\text{Z},2} & 1 & 0 & -2 & 1 & 0 & 2 & -4 \\
 n_{\text{Z},3} & 1 & 2 & -2 & 0 & -2 & 2 & 0 \\
 n_{\text{Z},4} & 1 & 2 & -2 & 0 & -2 & 2 & 0 \\
 n_{\text{M},1} & 1 & 2 & -3 & 0 & -2 & 4 & 0 \\
 n_{\text{M},2} & 1 & 2 & -3 & 0 & -2 & 4 & 0 \\
 n_{\text{M},3} & 1 & 0 & -1 & 1 & 0 & 0 & -4 \\
 n_{\text{M},4} & 1 & 0 & -1 & 1 & 0 & 0 & -4 \\
 n_{\text{L},1} & 1 & 1 & -1 & 1 & -2 & 0 & 0 \\
 n_{\text{L},2} & 1 & 1 & -3 & 0 & 0 & 4 & -4 \\
 n_{\text{V},1} & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\text{V},2} & 1 & 1 & -4 & 1 & -2 & 4 & -4
 \end{pmatrix} \tag{13}$$

$$\begin{pmatrix}
 \text{SG13} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 4 & 4 & 0 & 0 & 0 \\
 n_{\Gamma,1} & 1 & 2 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 2 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 \\
 n_{\text{B},1} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{Y},1} & 1 & 0 & 2 & 0 & 0 \\
 n_{\text{Y},2} & 1 & 0 & 2 & 0 & 0 \\
 n_{\text{Y},3} & 1 & 2 & -2 & 0 & 0 \\
 n_{\text{Y},4} & 1 & 2 & -2 & 0 & 0 \\
 n_{\text{Z},1} & 1 & 2 & -2 & -2 & 4 \\
 n_{\text{Z},2} & 1 & 2 & -2 & -2 & 4 \\
 n_{\text{Z},3} & 1 & 0 & 2 & 2 & -4 \\
 n_{\text{Z},4} & 1 & 0 & 2 & 2 & -4 \\
 n_{\text{C},1} & 1 & 0 & 0 & 2 & 0 \\
 n_{\text{C},2} & 1 & 0 & 0 & 2 & 0 \\
 n_{\text{C},3} & 1 & 2 & 0 & -2 & 0 \\
 n_{\text{C},4} & 1 & 2 & 0 & -2 & 0 \\
 n_{\text{D},1} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{A},1} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{E},1} & 1 & 1 & 0 & 0 & 0
 \end{pmatrix} \tag{14}$$

$$\begin{pmatrix}
 \text{SG14} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 8 & 4 & 4 & -8 & -16 \\
 n_{\Gamma,1} & 2 & 2 & 2 & -2 & -8 \\
 n_{\Gamma,2} & 2 & 2 & 2 & -2 & -8 \\
 n_{\Gamma,3} & 2 & 0 & 0 & -2 & 0 \\
 n_{\Gamma,4} & 2 & 0 & 0 & -2 & 0 \\
 n_{\text{B},1} & 2 & 1 & 1 & -2 & -4 \\
 n_{\text{Y},1} & 2 & 0 & 2 & -2 & -4 \\
 n_{\text{Y},2} & 2 & 0 & 2 & -2 & -4 \\
 n_{\text{Y},3} & 2 & 2 & 0 & -2 & -4 \\
 n_{\text{Y},4} & 2 & 2 & 0 & -2 & -4 \\
 n_{\text{Z},1} & 2 & 1 & 1 & -2 & -4 \\
 n_{\text{C},1} & 2 & 1 & 1 & -2 & -4 \\
 n_{\text{D},1} & 1 & 1 & 1 & -2 & -4 \\
 n_{\text{D},2} & 1 & 1 & 1 & -2 & -4 \\
 n_{\text{D},3} & 1 & 0 & 0 & 0 & 0 \\
 n_{\text{D},4} & 1 & 0 & 0 & 0 & 0 \\
 n_{\text{A},1} & 2 & 1 & 1 & -2 & -4 \\
 n_{\text{E},1} & 1 & 0 & 1 & 0 & -4 \\
 n_{\text{E},2} & 1 & 0 & 1 & 0 & -4 \\
 n_{\text{E},3} & 1 & 1 & 0 & -2 & 0 \\
 n_{\text{E},4} & 1 & 1 & 0 & -2 & 0
 \end{pmatrix} \tag{15}$$

$$\begin{pmatrix} \text{SG15} & a_1 & a_2 & a_3 & a_4 & a_5 \\ \nu & 4 & 4 & -12 & 16 & -16 \\ n_{\Gamma,1} & 1 & 2 & -6 & 8 & -8 \\ n_{\Gamma,2} & 1 & 2 & -6 & 8 & -8 \\ n_{\Gamma,3} & 1 & 0 & 0 & 0 & 0 \\ n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 \\ n_{A,1} & 1 & 1 & -3 & 4 & -4 \\ n_{Z,1} & 1 & 0 & -2 & 4 & -4 \\ n_{Z,2} & 1 & 0 & -2 & 4 & -4 \\ n_{Z,3} & 1 & 2 & -4 & 4 & -4 \\ n_{Z,4} & 1 & 2 & -4 & 4 & -4 \\ n_{M,1} & 1 & 1 & -3 & 4 & -4 \\ n_{L,1} & 1 & 2 & -5 & 6 & -4 \\ n_{L,2} & 1 & 0 & -1 & 2 & -4 \\ n_{V,1} & 1 & 1 & 0 & 0 & 0 \\ n_{V,2} & 1 & 1 & -6 & 8 & -8 \end{pmatrix} \tag{16}$$

$$\begin{pmatrix} \text{SG16} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{Y,1} & 1 \\ n_{X,1} & 1 \\ n_{Z,1} & 1 \\ n_{U,1} & 1 \\ n_{T,1} & 1 \\ n_{S,1} & 1 \\ n_{R,1} & 1 \end{pmatrix} \tag{17}$$

$$\begin{pmatrix} \text{SG17} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{Y,1} & 2 \\ n_{X,1} & 2 \\ n_{Z,1} & 1 \\ n_{Z,2} & 1 \\ n_{Z,3} & 1 \\ n_{Z,4} & 1 \\ n_{U,1} & 1 \\ n_{U,2} & 1 \\ n_{U,3} & 1 \\ n_{U,4} & 1 \\ n_{T,1} & 1 \\ n_{T,2} & 1 \\ n_{T,3} & 1 \\ n_{T,4} & 1 \\ n_{S,1} & 2 \\ n_{R,1} & 1 \\ n_{R,2} & 1 \\ n_{R,3} & 1 \\ n_{R,4} & 1 \end{pmatrix} \tag{18}$$

$$\begin{pmatrix} \text{SG18} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{Y,1} & 1 \\ n_{Y,2} & 1 \\ n_{Y,3} & 1 \\ n_{Y,4} & 1 \\ n_{X,1} & 1 \\ n_{X,2} & 1 \\ n_{X,3} & 1 \\ n_{X,4} & 1 \\ n_{Z,1} & 2 \\ n_{U,1} & 1 \\ n_{U,2} & 1 \\ n_{U,3} & 1 \\ n_{U,4} & 1 \\ n_{T,1} & 1 \\ n_{T,2} & 1 \\ n_{T,3} & 1 \\ n_{T,4} & 1 \\ n_{S,1} & 1 \\ n_{R,1} & 1 \end{pmatrix} \tag{19}$$

$$\begin{pmatrix} \text{SG19} & a_1 \\ \nu & 8 \\ n_{\Gamma,1} & 4 \\ n_{Y,1} & 2 \\ n_{Y,2} & 2 \\ n_{Y,3} & 2 \\ n_{Y,4} & 2 \\ n_{X,1} & 2 \\ n_{X,2} & 2 \\ n_{X,3} & 2 \\ n_{X,4} & 2 \\ n_{Z,1} & 2 \\ n_{Z,2} & 2 \\ n_{Z,3} & 2 \\ n_{Z,4} & 2 \\ n_{U,1} & 2 \\ n_{T,1} & 2 \\ n_{S,1} & 2 \\ n_{R,1} & 1 \\ n_{R,2} & 1 \\ n_{R,3} & 1 \\ n_{R,4} & 1 \end{pmatrix} \tag{20}$$

$$\begin{pmatrix} \text{SG20} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{\Upsilon,1} & 2 \\ n_{\mathbb{Z},1} & 1 \\ n_{\mathbb{Z},2} & 1 \\ n_{\mathbb{Z},3} & 1 \\ n_{\mathbb{Z},4} & 1 \\ n_{\mathbb{T},1} & 1 \\ n_{\mathbb{T},2} & 1 \\ n_{\mathbb{T},3} & 1 \\ n_{\mathbb{T},4} & 1 \\ n_{\mathbb{S},1} & 2 \\ n_{\mathbb{S},2} & 2 \\ n_{\mathbb{R},1} & 1 \\ n_{\mathbb{R},2} & 1 \end{pmatrix} \tag{21}$$

$$\begin{pmatrix} \text{SG21} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{\Upsilon,1} & 1 \\ n_{\mathbb{Z},1} & 1 \\ n_{\mathbb{T},1} & 1 \\ n_{\mathbb{S},1} & 1 \\ n_{\mathbb{S},2} & 0 \\ n_{\mathbb{R},1} & 1 \\ n_{\mathbb{R},2} & 0 \end{pmatrix} \tag{22}$$

$$\begin{pmatrix} \text{SG22} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{\Upsilon,1} & 1 \\ n_{\mathbb{X},1} & 1 \\ n_{\mathbb{Z},1} & 1 \\ n_{\mathbb{L},1} & 1 \end{pmatrix} \tag{23}$$

$$\begin{pmatrix} \text{SG23} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{\mathbb{X},1} & 1 \\ n_{\mathbb{R},1} & 1 \\ n_{\mathbb{R},2} & 1 \\ n_{\mathbb{S},1} & 1 \\ n_{\mathbb{S},2} & 1 \\ n_{\mathbb{T},1} & 1 \\ n_{\mathbb{T},2} & 1 \\ n_{\mathbb{W},1} & 1 \end{pmatrix} \tag{24}$$

$$\left(\begin{array}{cc} \text{SG24} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{X,1} & 2 \\ n_{R,1} & 2 \\ n_{R,2} & 2 \\ n_{S,1} & 2 \\ n_{S,2} & 2 \\ n_{T,1} & 2 \\ n_{T,2} & 2 \\ n_{W,1} & 1 \\ n_{W,2} & 1 \\ n_{W,3} & 1 \\ n_{W,4} & 1 \end{array} \right) \quad (25)$$

$$\left(\begin{array}{cc} \text{SG25} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{Y,1} & 1 \\ n_{X,1} & 1 \\ n_{Z,1} & 1 \\ n_{U,1} & 1 \\ n_{T,1} & 1 \\ n_{S,1} & 1 \\ n_{R,1} & 1 \end{array} \right) \quad (26)$$

$$\left(\begin{array}{cc} \text{SG26} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{Y,1} & 1 \\ n_{X,1} & 1 \\ n_{Z,1} & 1 \\ n_{U,1} & 1 \\ n_{T,1} & 1 \\ n_{S,1} & 1 \\ n_{R,1} & 1 \end{array} \right) \quad (27)$$

$$\left(\begin{array}{cc} \text{SG27} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{Y,1} & 1 \\ n_{X,1} & 1 \\ n_{Z,1} & 1 \\ n_{U,1} & 1 \\ n_{T,1} & 1 \\ n_{S,1} & 1 \\ n_{R,1} & 1 \end{array} \right) \quad (28)$$

$$\begin{pmatrix} \text{SG28} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{Y,1} & 1 \\ n_{Y,2} & 1 \\ n_{Y,3} & 1 \\ n_{Y,4} & 1 \\ n_{X,1} & 2 \\ n_{Z,1} & 2 \\ n_{U,1} & 2 \\ n_{T,1} & 1 \\ n_{T,2} & 1 \\ n_{T,3} & 1 \\ n_{T,4} & 1 \\ n_{S,1} & 1 \\ n_{S,2} & 1 \\ n_{S,3} & 1 \\ n_{S,4} & 1 \\ n_{R,1} & 1 \\ n_{R,2} & 1 \\ n_{R,3} & 1 \\ n_{R,4} & 1 \end{pmatrix} \tag{29}$$

$$\begin{pmatrix} \text{SG29} & a_1 \\ \nu & 8 \\ n_{\Gamma,1} & 4 \\ n_{Y,1} & 2 \\ n_{Y,2} & 2 \\ n_{Y,3} & 2 \\ n_{Y,4} & 2 \\ n_{X,1} & 4 \\ n_{Z,1} & 2 \\ n_{U,1} & 2 \\ n_{T,1} & 1 \\ n_{T,2} & 1 \\ n_{T,3} & 1 \\ n_{T,4} & 1 \\ n_{S,1} & 2 \\ n_{S,2} & 2 \\ n_{S,3} & 2 \\ n_{S,4} & 2 \\ n_{R,1} & 1 \\ n_{R,2} & 1 \\ n_{R,3} & 1 \\ n_{R,4} & 1 \end{pmatrix} \tag{30}$$

$$\begin{array}{r}
 \text{SG30} \quad a_1 \\
 \nu \quad 4 \\
 n_{\Gamma,1} \quad 2 \\
 n_{Y,1} \quad 1 \\
 n_{Y,2} \quad 1 \\
 n_{Y,3} \quad 1 \\
 n_{Y,4} \quad 1 \\
 n_{X,1} \quad 2 \\
 n_{Z,1} \quad 1 \\
 n_{U,1} \quad 1 \\
 n_{T,1} \quad 1 \\
 n_{T,2} \quad 1 \\
 n_{T,3} \quad 1 \\
 n_{T,4} \quad 1 \\
 n_{S,1} \quad 1 \\
 n_{S,2} \quad 1 \\
 n_{S,3} \quad 1 \\
 n_{S,4} \quad 1 \\
 n_{R,1} \quad 1 \\
 n_{R,2} \quad 1 \\
 n_{R,3} \quad 1 \\
 n_{R,4} \quad 1
 \end{array}
 \tag{31}$$

$$\begin{array}{r}
 \text{SG31} \quad a_1 \\
 \nu \quad 4 \\
 n_{\Gamma,1} \quad 2 \\
 n_{Y,1} \quad 1 \\
 n_{Y,2} \quad 1 \\
 n_{Y,3} \quad 1 \\
 n_{Y,4} \quad 1 \\
 n_{X,1} \quad 2 \\
 n_{Z,1} \quad 1 \\
 n_{U,1} \quad 1 \\
 n_{T,1} \quad 1 \\
 n_{T,2} \quad 1 \\
 n_{T,3} \quad 1 \\
 n_{T,4} \quad 1 \\
 n_{S,1} \quad 1 \\
 n_{S,2} \quad 1 \\
 n_{S,3} \quad 1 \\
 n_{S,4} \quad 1 \\
 n_{R,1} \quad 1 \\
 n_{R,2} \quad 1 \\
 n_{R,3} \quad 1 \\
 n_{R,4} \quad 1
 \end{array}
 \tag{32}$$

$$\begin{array}{r}
 \text{SG32} \quad a_1 \\
 \nu \quad 4 \\
 n_{\Gamma,1} \quad 2 \\
 n_{Y,1} \quad 1 \\
 n_{Y,2} \quad 1 \\
 n_{Y,3} \quad 1 \\
 n_{Y,4} \quad 1 \\
 n_{X,1} \quad 1 \\
 n_{X,2} \quad 1 \\
 n_{X,3} \quad 1 \\
 n_{X,4} \quad 1 \\
 n_{Z,1} \quad 2 \\
 n_{U,1} \quad 1 \\
 n_{U,2} \quad 1 \\
 n_{U,3} \quad 1 \\
 n_{U,4} \quad 1 \\
 n_{T,1} \quad 1 \\
 n_{T,2} \quad 1 \\
 n_{T,3} \quad 1 \\
 n_{T,4} \quad 1 \\
 n_{S,1} \quad 1 \\
 n_{R,1} \quad 1
 \end{array}
 \tag{33}$$

$$\begin{array}{r}
 \text{SG33} \quad a_1 \\
 \nu \quad 8 \\
 n_{\Gamma,1} \quad 4 \\
 n_{Y,1} \quad 2 \\
 n_{Y,2} \quad 2 \\
 n_{Y,3} \quad 2 \\
 n_{Y,4} \quad 2 \\
 n_{X,1} \quad 2 \\
 n_{X,2} \quad 2 \\
 n_{X,3} \quad 2 \\
 n_{X,4} \quad 2 \\
 n_{Z,1} \quad 2 \\
 n_{U,1} \quad 2 \\
 n_{U,2} \quad 2 \\
 n_{U,3} \quad 2 \\
 n_{U,4} \quad 2 \\
 n_{T,1} \quad 1 \\
 n_{T,2} \quad 1 \\
 n_{T,3} \quad 1 \\
 n_{T,4} \quad 1 \\
 n_{S,1} \quad 2 \\
 n_{R,1} \quad 2
 \end{array}
 \tag{34}$$

$$\begin{pmatrix} \text{SG34} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{\Upsilon,1} & 1 \\ n_{\Upsilon,2} & 1 \\ n_{\Upsilon,3} & 1 \\ n_{\Upsilon,4} & 1 \\ n_{\text{X},1} & 1 \\ n_{\text{X},2} & 1 \\ n_{\text{X},3} & 1 \\ n_{\text{X},4} & 1 \\ n_{\text{Z},1} & 1 \\ n_{\text{U},1} & 1 \\ n_{\text{U},2} & 1 \\ n_{\text{U},3} & 1 \\ n_{\text{U},4} & 1 \\ n_{\text{T},1} & 1 \\ n_{\text{T},2} & 1 \\ n_{\text{T},3} & 1 \\ n_{\text{T},4} & 1 \\ n_{\text{S},1} & 1 \\ n_{\text{R},1} & 2 \end{pmatrix} \tag{35}$$

$$\begin{pmatrix} \text{SG35} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{\Upsilon,1} & 1 \\ n_{\text{Z},1} & 1 \\ n_{\text{T},1} & 1 \\ n_{\text{S},1} & 1 \\ n_{\text{S},2} & 1 \\ n_{\text{R},1} & 1 \\ n_{\text{R},2} & 1 \end{pmatrix} \tag{36}$$

$$\begin{pmatrix} \text{SG36} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{\Upsilon,1} & 2 \\ n_{\text{Z},1} & 1 \\ n_{\text{T},1} & 1 \\ n_{\text{S},1} & 2 \\ n_{\text{S},2} & 2 \\ n_{\text{R},1} & 1 \\ n_{\text{R},2} & 1 \end{pmatrix} \tag{37}$$

$$\left(\begin{array}{cc} \text{SG37} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{\Upsilon,1} & 2 \\ n_{Z,1} & 1 \\ n_{T,1} & 1 \\ n_{S,1} & 2 \\ n_{S,2} & 2 \\ n_{R,1} & 2 \\ n_{R,2} & 2 \end{array} \right) \quad (38)$$

$$\left(\begin{array}{cc} \text{SG38} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{\Upsilon,1} & 1 \\ n_{Z,1} & 1 \\ n_{T,1} & 1 \\ n_{S,1} & 1 \\ n_{S,2} & 1 \\ n_{R,1} & 1 \\ n_{R,2} & 1 \end{array} \right) \quad (39)$$

$$\left(\begin{array}{cc} \text{SG39} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{\Upsilon,1} & 2 \\ n_{X,1} & 2 \\ n_{T,1} & 2 \\ n_{S,1} & 1 \\ n_{S,2} & 1 \\ n_{R,1} & 1 \\ n_{R,2} & 1 \end{array} \right) \quad (40)$$

$$\left(\begin{array}{cc} \text{SG40} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{\Upsilon,1} & 2 \\ n_{Z,1} & 1 \\ n_{Z,2} & 1 \\ n_{Z,3} & 1 \\ n_{Z,4} & 1 \\ n_{T,1} & 1 \\ n_{T,2} & 1 \\ n_{T,3} & 1 \\ n_{T,4} & 1 \\ n_{S,1} & 2 \\ n_{S,2} & 2 \\ n_{R,1} & 2 \\ n_{R,2} & 2 \end{array} \right) \quad (41)$$

$$\left(\begin{array}{cc} \text{SG41} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{Y,1} & 2 \\ n_{Z,1} & 1 \\ n_{Z,2} & 1 \\ n_{Z,3} & 1 \\ n_{Z,4} & 1 \\ n_{T,1} & 1 \\ n_{T,2} & 1 \\ n_{T,3} & 1 \\ n_{T,4} & 1 \\ n_{S,1} & 1 \\ n_{S,2} & 1 \\ n_{R,1} & 1 \\ n_{R,2} & 1 \end{array} \right) \quad (42)$$

$$\left(\begin{array}{cc} \text{SG42} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{Y,1} & 1 \\ n_{X,1} & 1 \\ n_{Z,1} & 1 \\ n_{L,1} & 1 \end{array} \right) \quad (43)$$

$$\left(\begin{array}{cc} \text{SG43} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{Y,1} & 1 \\ n_{Y,2} & 1 \\ n_{Y,3} & 1 \\ n_{Y,4} & 1 \\ n_{X,1} & 1 \\ n_{X,2} & 1 \\ n_{X,3} & 1 \\ n_{X,4} & 1 \\ n_{Z,1} & 1 \\ n_{L,1} & 2 \end{array} \right) \quad (44)$$

$$\left(\begin{array}{cc} \text{SG43} & a_1 \\ \nu & 2 \\ n_{\Gamma,1} & 1 \\ n_{X,1} & 1 \\ n_{R,1} & 1 \\ n_{R,2} & 1 \\ n_{S,1} & 1 \\ n_{S,2} & 1 \\ n_{T,1} & 1 \\ n_{T,2} & 1 \\ n_{W,1} & 1 \\ n_{W,2} & 1 \end{array} \right) \quad (45)$$

$$\begin{pmatrix} \text{SG45} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{X,1} & 2 \\ n_{R,1} & 1 \\ n_{R,2} & 1 \\ n_{S,1} & 1 \\ n_{S,2} & 1 \\ n_{T,1} & 2 \\ n_{T,2} & 2 \\ n_{W,1} & 1 \\ n_{W,2} & 1 \end{pmatrix} \tag{46}$$

$$\begin{pmatrix} \text{SG46} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 2 \\ n_{X,1} & 2 \\ n_{R,1} & 2 \\ n_{R,2} & 2 \\ n_{S,1} & 1 \\ n_{S,2} & 1 \\ n_{T,1} & 2 \\ n_{T,2} & 2 \\ n_{W,1} & 2 \\ n_{W,2} & 2 \end{pmatrix} \tag{47}$$

$$\begin{pmatrix} \text{SG47} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 \\ \nu & 4 & 2 & 2 & 2 & -2 & 4 & -4 & -4 & 8 \\ n_{\Gamma,1} & 1 & 1 & 1 & 1 & -1 & 2 & -2 & -2 & 4 \\ n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{Y,1} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{Y,2} & 1 & 1 & 0 & 1 & -1 & 2 & -2 & -2 & 4 \\ n_{X,1} & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ n_{X,2} & 1 & 1 & 1 & 1 & -2 & 2 & -2 & -2 & 4 \\ n_{Z,1} & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{Z,2} & 1 & 1 & 1 & 0 & -1 & 2 & -2 & -2 & 4 \\ n_{U,1} & 1 & 1 & 1 & 0 & 0 & 0 & -2 & 0 & 4 \\ n_{U,2} & 1 & 0 & 0 & 1 & -1 & 2 & 0 & -2 & 0 \\ n_{T,1} & 1 & 1 & 0 & 0 & 1 & 0 & -2 & -2 & 4 \\ n_{T,2} & 1 & 0 & 1 & 1 & -2 & 2 & 0 & 0 & 0 \\ n_{S,1} & 1 & 1 & 0 & 1 & 0 & 0 & 0 & -2 & 4 \\ n_{S,2} & 1 & 0 & 1 & 0 & -1 & 2 & -2 & 0 & 0 \\ n_{R,1} & 1 & 0 & 1 & 1 & -1 & 2 & -2 & -2 & 4 \\ n_{R,2} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix} \tag{48}$$

$$\begin{pmatrix}
 \text{SG48} & a_1 & a_2 & a_3 \\
 \nu & 4 & 8 & 0 \\
 n_{\Gamma,1} & 1 & 4 & 0 \\
 n_{\Gamma,2} & 1 & 0 & 0 \\
 n_{\Upsilon,1} & 1 & 2 & 0 \\
 n_{\Upsilon,2} & 1 & 2 & 0 \\
 n_{\chi,1} & 1 & 2 & 0 \\
 n_{\chi,2} & 1 & 2 & 0 \\
 n_{\zeta,1} & 1 & 2 & 0 \\
 n_{\zeta,2} & 1 & 2 & 0 \\
 n_{\text{U},1} & 1 & 2 & 0 \\
 n_{\text{U},2} & 1 & 2 & 0 \\
 n_{\text{T},1} & 1 & 2 & 0 \\
 n_{\text{T},2} & 1 & 2 & 0 \\
 n_{\text{S},1} & 1 & 2 & 0 \\
 n_{\text{S},2} & 1 & 2 & 0 \\
 n_{\text{R},1} & 1 & 4 & -4 \\
 n_{\text{R},2} & 1 & 0 & 4
 \end{pmatrix}
 \tag{49}$$

$$\begin{pmatrix}
 \text{SG49} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 4 & 4 & 0 & 0 & 0 \\
 n_{\Gamma,1} & 1 & 2 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 \\
 n_{\Upsilon,1} & 1 & 2 & -2 & -2 & 4 \\
 n_{\Upsilon,2} & 1 & 0 & 2 & 2 & -4 \\
 n_{\chi,1} & 1 & 0 & 2 & 0 & 0 \\
 n_{\chi,2} & 1 & 2 & -2 & 0 & 0 \\
 n_{\zeta,1} & 1 & 1 & 0 & 0 & 0 \\
 n_{\zeta,2} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{U},1} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{U},2} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{T},1} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{T},2} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{S},1} & 1 & 0 & 0 & 2 & 0 \\
 n_{\text{S},2} & 1 & 2 & 0 & -2 & 0 \\
 n_{\text{R},1} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{R},2} & 1 & 1 & 0 & 0 & 0
 \end{pmatrix}
 \tag{50}$$

$$\begin{pmatrix} \text{SG50} & a_1 & a_2 & a_3 \\ \nu & 4 & 8 & 0 \\ n_{\Gamma,1} & 1 & 4 & 0 \\ n_{\Gamma,2} & 1 & 0 & 0 \\ n_{\Upsilon,1} & 1 & 2 & 0 \\ n_{\Upsilon,2} & 1 & 2 & 0 \\ n_{\chi,1} & 1 & 2 & 0 \\ n_{\chi,2} & 1 & 2 & 0 \\ n_{\mathcal{Z},1} & 1 & 0 & 4 \\ n_{\mathcal{Z},2} & 1 & 4 & -4 \\ n_{\mathcal{U},1} & 1 & 2 & 0 \\ n_{\mathcal{U},2} & 1 & 2 & 0 \\ n_{\mathcal{T},1} & 1 & 2 & 0 \\ n_{\mathcal{T},2} & 1 & 2 & 0 \\ n_{\mathcal{S},1} & 1 & 2 & 0 \\ n_{\mathcal{S},2} & 1 & 2 & 0 \\ n_{\mathcal{R},1} & 1 & 2 & 0 \\ n_{\mathcal{R},2} & 1 & 2 & 0 \end{pmatrix} \tag{51}$$

$$\begin{pmatrix} \text{SG51} & a_1 & a_2 & a_3 & a_4 & a_5 \\ \nu & 4 & 4 & 0 & 0 & 0 \\ n_{\Gamma,1} & 1 & 2 & 0 & 0 & 0 \\ n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 \\ n_{\Upsilon,1} & 1 & 0 & 2 & 0 & 0 \\ n_{\Upsilon,2} & 1 & 2 & -2 & 0 & 0 \\ n_{\chi,1} & 1 & 0 & 0 & 2 & 0 \\ n_{\chi,2} & 1 & 2 & 0 & -2 & 0 \\ n_{\mathcal{Z},1} & 1 & 1 & 0 & 0 & 0 \\ n_{\mathcal{Z},2} & 1 & 1 & 0 & 0 & 0 \\ n_{\mathcal{U},1} & 1 & 1 & 0 & 0 & 0 \\ n_{\mathcal{U},2} & 1 & 1 & 0 & 0 & 0 \\ n_{\mathcal{T},1} & 1 & 1 & 0 & 0 & 0 \\ n_{\mathcal{T},2} & 1 & 1 & 0 & 0 & 0 \\ n_{\mathcal{S},1} & 1 & 2 & -2 & -2 & 4 \\ n_{\mathcal{S},2} & 1 & 0 & 2 & 2 & -4 \\ n_{\mathcal{R},1} & 1 & 1 & 0 & 0 & 0 \\ n_{\mathcal{R},2} & 1 & 1 & 0 & 0 & 0 \end{pmatrix} \tag{52}$$

$$\begin{pmatrix}
 \text{SG52} & a_1 & a_2 & a_3 \\
 \nu & 8 & 8 & -32 \\
 n_{\Gamma,1} & 2 & 4 & -12 \\
 n_{\Gamma,2} & 2 & 0 & -4 \\
 n_{Y,1} & 2 & 2 & -8 \\
 n_{Y,2} & 2 & 2 & -8 \\
 n_{X,1} & 2 & 2 & -8 \\
 n_{X,2} & 2 & 2 & -8 \\
 n_{Z,1} & 2 & 2 & -8 \\
 n_{Z,2} & 2 & 2 & -8 \\
 n_{U,1} & 1 & 1 & -4 \\
 n_{U,2} & 1 & 1 & -4 \\
 n_{T,1} & 1 & 0 & 0 \\
 n_{T,2} & 1 & 0 & 0 \\
 n_{T,3} & 1 & 0 & 0 \\
 n_{T,4} & 1 & 0 & 0 \\
 n_{T,5} & 1 & 2 & -8 \\
 n_{T,6} & 1 & 2 & -8 \\
 n_{T,7} & 1 & 2 & -8 \\
 n_{T,8} & 1 & 2 & -8 \\
 n_{S,1} & 2 & 2 & -8 \\
 n_{S,2} & 2 & 2 & -8 \\
 n_{R,1} & 2 & 2 & -8 \\
 n_{R,2} & 2 & 2 & -8
 \end{pmatrix} \tag{53}$$

$$\begin{pmatrix}
 \text{SG53} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 8 & 4 & -20 & 24 & -16 \\
 n_{\Gamma,1} & 2 & 2 & -8 & 10 & -8 \\
 n_{\Gamma,2} & 2 & 0 & -2 & 2 & 0 \\
 n_{Y,1} & 2 & 1 & -5 & 6 & -4 \\
 n_{Y,2} & 2 & 1 & -5 & 6 & -4 \\
 n_{X,1} & 2 & 0 & -4 & 6 & -4 \\
 n_{X,2} & 2 & 2 & -6 & 6 & -4 \\
 n_{Z,1} & 2 & 1 & -5 & 6 & -4 \\
 n_{Z,2} & 2 & 1 & -5 & 6 & -4 \\
 n_{U,1} & 2 & 1 & -5 & 6 & -4 \\
 n_{U,2} & 2 & 1 & -5 & 6 & -4 \\
 n_{T,1} & 1 & 0 & -3 & 4 & -4 \\
 n_{T,2} & 1 & 0 & -3 & 4 & -4 \\
 n_{T,3} & 1 & 0 & -3 & 4 & -4 \\
 n_{T,4} & 1 & 0 & -3 & 4 & -4 \\
 n_{T,5} & 1 & 1 & -2 & 2 & 0 \\
 n_{T,6} & 1 & 1 & -2 & 2 & 0 \\
 n_{T,7} & 1 & 1 & -2 & 2 & 0 \\
 n_{T,8} & 1 & 1 & -2 & 2 & 0 \\
 n_{S,1} & 2 & 1 & -5 & 6 & -4 \\
 n_{S,2} & 2 & 1 & -5 & 6 & -4 \\
 n_{R,1} & 1 & 1 & -5 & 6 & -4 \\
 n_{R,2} & 1 & 1 & -5 & 6 & -4 \\
 n_{R,3} & 1 & 1 & -5 & 6 & -4 \\
 n_{R,4} & 1 & 1 & -5 & 6 & -4 \\
 n_{R,5} & 1 & 0 & 0 & 0 & 0 \\
 n_{R,6} & 1 & 0 & 0 & 0 & 0 \\
 n_{R,7} & 1 & 0 & 0 & 0 & 0 \\
 n_{R,8} & 1 & 0 & 0 & 0 & 0
 \end{pmatrix} \tag{54}$$

$$\begin{pmatrix} \text{SG54} & a_1 & a_2 & a_3 \\ \nu & 8 & 0 & 0 \\ n_{\Gamma,1} & 2 & 2 & 0 \\ n_{\Gamma,2} & 2 & -2 & 0 \\ n_{Y,1} & 2 & -2 & 4 \\ n_{Y,2} & 2 & 2 & -4 \\ n_{X,1} & 2 & 0 & 0 \\ n_{X,2} & 2 & 0 & 0 \\ n_{Z,1} & 2 & 0 & 0 \\ n_{Z,2} & 2 & 0 & 0 \\ n_{U,1} & 1 & 0 & 0 \\ n_{U,2} & 1 & 0 & 0 \\ n_{T,1} & 2 & 0 & 0 \\ n_{T,2} & 2 & 0 & 0 \\ n_{S,1} & 2 & 0 & 0 \\ n_{S,2} & 2 & 0 & 0 \\ n_{R,1} & 1 & 0 & 0 \\ n_{R,2} & 1 & 0 & 0 \end{pmatrix} \tag{55}$$

$$\begin{pmatrix} \text{SG55} & a_1 & a_2 & a_3 & a_4 & a_5 \\ \nu & 8 & 4 & 4 & -8 & -16 \\ n_{\Gamma,1} & 2 & 2 & 2 & -2 & -8 \\ n_{\Gamma,2} & 2 & 0 & 0 & -2 & 0 \\ n_{Y,1} & 2 & 1 & 1 & -2 & -4 \\ n_{Y,2} & 2 & 1 & 1 & -2 & -4 \\ n_{X,1} & 2 & 1 & 1 & -2 & -4 \\ n_{X,2} & 2 & 1 & 1 & -2 & -4 \\ n_{Z,1} & 2 & 0 & 2 & -2 & -4 \\ n_{Z,2} & 2 & 2 & 0 & -2 & -4 \\ n_{U,1} & 2 & 1 & 1 & -2 & -4 \\ n_{U,2} & 2 & 1 & 1 & -2 & -4 \\ n_{T,1} & 2 & 1 & 1 & -2 & -4 \\ n_{T,2} & 2 & 1 & 1 & -2 & -4 \\ n_{S,1} & 1 & 0 & 0 & 0 & 0 \\ n_{S,2} & 1 & 1 & 1 & -2 & -4 \\ n_{R,1} & 1 & 1 & 0 & -2 & 0 \\ n_{R,2} & 1 & 0 & 1 & 0 & -4 \end{pmatrix} \tag{56}$$

$$\begin{array}{c}
 \text{SG56} \\
 \nu \\
 n_{\Gamma,1} \\
 n_{\Gamma,2} \\
 n_{Y,1} \\
 n_{Y,2} \\
 n_{X,1} \\
 n_{X,2} \\
 n_{Z,1} \\
 n_{Z,2} \\
 n_{U,1} \\
 n_{U,2} \\
 n_{T,1} \\
 n_{T,2} \\
 n_{S,1} \\
 n_{S,2} \\
 n_{R,1} \\
 n_{R,2}
 \end{array}
 \begin{array}{ccc}
 a_1 & a_2 & a_3 \\
 8 & 8 & -32 \\
 2 & 4 & -12 \\
 2 & 0 & -4 \\
 2 & 2 & -8 \\
 2 & 2 & -8 \\
 2 & 2 & -8 \\
 2 & 2 & -8 \\
 2 & 2 & -8 \\
 2 & 2 & -8 \\
 1 & 1 & -4 \\
 1 & 1 & -4 \\
 1 & 1 & -4 \\
 1 & 1 & -4 \\
 2 & 2 & -8 \\
 2 & 2 & -8 \\
 1 & 2 & -8 \\
 1 & 0 & 0
 \end{array}
 \right)
 \tag{57}$$

$$\begin{array}{c}
 \text{SG57} \\
 \nu \\
 n_{\Gamma,1} \\
 n_{\Gamma,2} \\
 n_{Y,1} \\
 n_{Y,2} \\
 n_{X,1} \\
 n_{X,2} \\
 n_{Z,1} \\
 n_{Z,2} \\
 n_{U,1} \\
 n_{U,2} \\
 n_{T,1} \\
 n_{T,2} \\
 n_{S,1} \\
 n_{S,2} \\
 n_{R,1} \\
 n_{R,2}
 \end{array}
 \begin{array}{ccc}
 a_1 & a_2 & a_3 \\
 8 & 0 & 0 \\
 2 & 2 & 0 \\
 2 & -2 & 0 \\
 2 & 0 & 0 \\
 2 & 0 & 0 \\
 2 & 0 & 0 \\
 2 & 0 & 0 \\
 2 & -2 & 4 \\
 2 & 2 & -4 \\
 2 & 0 & 0 \\
 2 & 0 & 0 \\
 2 & 0 & 0 \\
 2 & 0 & 0 \\
 1 & 0 & 0 \\
 1 & 0 & 0 \\
 1 & 0 & 0 \\
 1 & 0 & 0
 \end{array}
 \right)
 \tag{58}$$

$$\begin{pmatrix}
 \text{SG58} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 8 & 4 & 4 & 4 & -48 \\
 n_{\Gamma,1} & 2 & 2 & 2 & 2 & -20 \\
 n_{\Gamma,2} & 2 & 0 & 0 & 0 & -4 \\
 n_{Y,1} & 2 & 1 & 1 & 1 & -12 \\
 n_{Y,2} & 2 & 1 & 1 & 1 & -12 \\
 n_{X,1} & 2 & 1 & 1 & 1 & -12 \\
 n_{X,2} & 2 & 1 & 1 & 1 & -12 \\
 n_{Z,1} & 2 & 1 & 1 & 1 & -12 \\
 n_{Z,2} & 2 & 1 & 1 & 1 & -12 \\
 n_{U,1} & 1 & 1 & 0 & 1 & -8 \\
 n_{U,2} & 1 & 1 & 0 & 1 & -8 \\
 n_{U,3} & 1 & 1 & 0 & 1 & -8 \\
 n_{U,4} & 1 & 1 & 0 & 1 & -8 \\
 n_{U,5} & 1 & 0 & 1 & 0 & -4 \\
 n_{U,6} & 1 & 0 & 1 & 0 & -4 \\
 n_{U,7} & 1 & 0 & 1 & 0 & -4 \\
 n_{U,8} & 1 & 0 & 1 & 0 & -4 \\
 n_{T,1} & 1 & 0 & 1 & 1 & -8 \\
 n_{T,2} & 1 & 0 & 1 & 1 & -8 \\
 n_{T,3} & 1 & 0 & 1 & 1 & -8 \\
 n_{T,4} & 1 & 0 & 1 & 1 & -8 \\
 n_{T,5} & 1 & 1 & 0 & 0 & -4 \\
 n_{T,6} & 1 & 1 & 0 & 0 & -4 \\
 n_{T,7} & 1 & 1 & 0 & 0 & -4 \\
 n_{T,8} & 1 & 1 & 0 & 0 & -4 \\
 n_{S,1} & 1 & 0 & 0 & 1 & -4 \\
 n_{S,2} & 1 & 1 & 1 & 0 & -8 \\
 n_{R,1} & 2 & 1 & 1 & 1 & -12 \\
 n_{R,2} & 2 & 1 & 1 & 1 & -12
 \end{pmatrix}
 \tag{59}$$

$$\begin{pmatrix}
 \text{SG59} & a_1 & a_2 & a_3 \\
 \nu & 4 & 8 & 0 \\
 n_{\Gamma,1} & 1 & 4 & 0 \\
 n_{\Gamma,2} & 1 & 0 & 0 \\
 n_{Y,1} & 1 & 2 & 0 \\
 n_{Y,2} & 1 & 2 & 0 \\
 n_{X,1} & 1 & 2 & 0 \\
 n_{X,2} & 1 & 2 & 0 \\
 n_{Z,1} & 1 & 0 & 4 \\
 n_{Z,2} & 1 & 4 & -4 \\
 n_{U,1} & 1 & 2 & 0 \\
 n_{U,2} & 1 & 2 & 0 \\
 n_{T,1} & 1 & 2 & 0 \\
 n_{T,2} & 1 & 2 & 0 \\
 n_{S,1} & 1 & 2 & 0 \\
 n_{S,2} & 1 & 2 & 0 \\
 n_{R,1} & 1 & 2 & 0 \\
 n_{R,2} & 1 & 2 & 0
 \end{pmatrix}
 \tag{60}$$

$$\begin{pmatrix}
 \text{SG60} & a_1 & a_2 & a_3 \\
 \nu & 8 & 8 & -32 \\
 n_{\Gamma,1} & 2 & 4 & -12 \\
 n_{\Gamma,2} & 2 & 0 & -4 \\
 n_{Y,1} & 2 & 2 & -8 \\
 n_{Y,2} & 2 & 2 & -8 \\
 n_{X,1} & 2 & 2 & -8 \\
 n_{X,2} & 2 & 2 & -8 \\
 n_{Z,1} & 2 & 2 & -8 \\
 n_{Z,2} & 2 & 2 & -8 \\
 n_{U,1} & 1 & 0 & 0 \\
 n_{U,2} & 1 & 0 & 0 \\
 n_{U,3} & 1 & 0 & 0 \\
 n_{U,4} & 1 & 0 & 0 \\
 n_{U,5} & 1 & 2 & -8 \\
 n_{U,6} & 1 & 2 & -8 \\
 n_{U,7} & 1 & 2 & -8 \\
 n_{U,8} & 1 & 2 & -8 \\
 n_{T,1} & 1 & 1 & -4 \\
 n_{T,2} & 1 & 1 & -4 \\
 n_{S,1} & 1 & 1 & -4 \\
 n_{S,2} & 1 & 1 & -4 \\
 n_{R,1} & 1 & 1 & -4 \\
 n_{R,2} & 1 & 1 & -4
 \end{pmatrix} \tag{61}$$

$$\begin{pmatrix}
 \text{SG61} & a_1 & a_2 & a_3 \\
 \nu & 16 & 8 & -32 \\
 n_{\Gamma,1} & 4 & 4 & -12 \\
 n_{\Gamma,2} & 4 & 0 & -4 \\
 n_{Y,1} & 4 & 2 & -8 \\
 n_{Y,2} & 4 & 2 & -8 \\
 n_{X,1} & 4 & 2 & -8 \\
 n_{X,2} & 4 & 2 & -8 \\
 n_{Z,1} & 4 & 2 & -8 \\
 n_{Z,2} & 4 & 2 & -8 \\
 n_{U,1} & 2 & 1 & -4 \\
 n_{U,2} & 2 & 1 & -4 \\
 n_{T,1} & 2 & 1 & -4 \\
 n_{T,2} & 2 & 1 & -4 \\
 n_{S,1} & 2 & 1 & -4 \\
 n_{S,2} & 2 & 1 & -4 \\
 n_{R,1} & 1 & 0 & 0 \\
 n_{R,2} & 1 & 0 & 0 \\
 n_{R,3} & 1 & 0 & 0 \\
 n_{R,4} & 1 & 0 & 0 \\
 n_{R,5} & 1 & 1 & -4 \\
 n_{R,6} & 1 & 1 & -4 \\
 n_{R,7} & 1 & 1 & -4 \\
 n_{R,8} & 1 & 1 & -4
 \end{pmatrix} \tag{62}$$

$$\begin{pmatrix} \text{SG62} & a_1 & a_2 & a_3 \\ \nu & 8 & 8 & -32 \\ n_{\Gamma,1} & 2 & 4 & -12 \\ n_{\Gamma,2} & 2 & 0 & -4 \\ n_{Y,1} & 2 & 2 & -8 \\ n_{Y,2} & 2 & 2 & -8 \\ n_{X,1} & 2 & 2 & -8 \\ n_{X,2} & 2 & 2 & -8 \\ n_{Z,1} & 2 & 2 & -8 \\ n_{Z,2} & 2 & 2 & -8 \\ n_{U,1} & 1 & 0 & 0 \\ n_{U,2} & 1 & 2 & -8 \\ n_{T,1} & 2 & 2 & -8 \\ n_{T,2} & 2 & 2 & -8 \\ n_{S,1} & 1 & 1 & -4 \\ n_{S,2} & 1 & 1 & -4 \\ n_{R,1} & 1 & 1 & -4 \\ n_{R,2} & 1 & 1 & -4 \end{pmatrix} \tag{63}$$

$$\begin{pmatrix} \text{SG63} & a_1 & a_2 & a_3 & a_4 \\ \nu & 4 & -4 & 8 & -16 \\ n_{\Gamma,1} & 1 & -2 & 4 & -8 \\ n_{\Gamma,2} & 1 & 0 & 0 & 0 \\ n_{Y,1} & 1 & -2 & 4 & -4 \\ n_{Y,2} & 1 & 0 & 0 & -4 \\ n_{Z,1} & 1 & -1 & 2 & -4 \\ n_{Z,2} & 1 & -1 & 2 & -4 \\ n_{T,1} & 1 & -1 & 2 & -4 \\ n_{T,2} & 1 & -1 & 2 & -4 \\ n_{S,1} & 1 & 2 & -2 & 0 \\ n_{S,2} & 1 & 2 & -2 & 0 \\ n_{S,3} & 1 & -4 & 6 & -8 \\ n_{S,4} & 1 & -4 & 6 & -8 \\ n_{R,1} & 1 & -1 & 2 & -4 \end{pmatrix} \tag{64}$$

$$\begin{pmatrix} \text{SG64} & a_1 & a_2 & a_3 & a_4 \\ \nu & 8 & -12 & 16 & -16 \\ n_{\Gamma,1} & 2 & -4 & 6 & -8 \\ n_{\Gamma,2} & 2 & -2 & 2 & 0 \\ n_{Y,1} & 2 & -4 & 6 & -4 \\ n_{Y,2} & 2 & -2 & 2 & -4 \\ n_{Z,1} & 2 & -3 & 4 & -4 \\ n_{Z,2} & 2 & -3 & 4 & -4 \\ n_{T,1} & 2 & -3 & 4 & -4 \\ n_{T,2} & 2 & -3 & 4 & -4 \\ n_{S,1} & 2 & -3 & 4 & -4 \\ n_{R,1} & 1 & 0 & 0 & 0 \\ n_{R,2} & 1 & 0 & 0 & 0 \\ n_{R,3} & 1 & -3 & 4 & -4 \\ n_{R,4} & 1 & -3 & 4 & -4 \end{pmatrix} \tag{65}$$

$$\begin{pmatrix} \text{SG65} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 \\ \nu & 4 & 4 & -8 & 2 & -4 & 8 & -8 \\ n_{\Gamma,1} & 1 & 2 & -4 & 1 & -2 & 4 & -4 \\ n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{Y,1} & 1 & 0 & -2 & 1 & 0 & 2 & -4 \\ n_{Y,2} & 1 & 2 & -2 & 0 & -2 & 2 & 0 \\ n_{Z,1} & 1 & 0 & -1 & 0 & 0 & 2 & -4 \\ n_{Z,2} & 1 & 2 & -3 & 1 & -2 & 2 & 0 \\ n_{T,1} & 1 & 2 & -3 & 0 & -2 & 4 & 0 \\ n_{T,2} & 1 & 0 & -1 & 1 & 0 & 0 & -4 \\ n_{S,1} & 1 & 1 & -1 & 1 & -2 & 0 & 0 \\ n_{S,2} & 1 & 1 & -1 & 1 & -2 & 0 & 0 \\ n_{S,3} & 1 & 1 & -3 & 0 & 0 & 4 & -4 \\ n_{S,4} & 1 & 1 & -3 & 0 & 0 & 4 & -4 \\ n_{R,1} & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{R,2} & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{R,3} & 1 & 1 & -4 & 1 & -2 & 4 & -4 \\ n_{R,4} & 1 & 1 & -4 & 1 & -2 & 4 & -4 \end{pmatrix} \tag{66}$$

$$\begin{pmatrix} \text{SG66} & a_1 & a_2 & a_3 & a_4 & a_5 \\ \nu & 4 & 4 & -12 & 16 & -16 \\ n_{\Gamma,1} & 1 & 2 & -6 & 8 & -8 \\ n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 \\ n_{Y,1} & 1 & 0 & -2 & 4 & -4 \\ n_{Y,2} & 1 & 2 & -4 & 4 & -4 \\ n_{Z,1} & 1 & 1 & -3 & 4 & -4 \\ n_{Z,2} & 1 & 1 & -3 & 4 & -4 \\ n_{T,1} & 1 & 1 & -3 & 4 & -4 \\ n_{T,2} & 1 & 1 & -3 & 4 & -4 \\ n_{S,1} & 1 & 1 & 0 & 0 & 0 \\ n_{S,2} & 1 & 1 & 0 & 0 & 0 \\ n_{S,3} & 1 & 1 & -6 & 8 & -8 \\ n_{S,4} & 1 & 1 & -6 & 8 & -8 \\ n_{R,1} & 1 & 2 & -5 & 6 & -4 \\ n_{R,2} & 1 & 2 & -5 & 6 & -4 \\ n_{R,3} & 1 & 0 & -1 & 2 & -4 \\ n_{R,4} & 1 & 0 & -1 & 2 & -4 \end{pmatrix} \tag{67}$$

$$\begin{pmatrix} \text{SG67} & a_1 & a_2 & a_3 & a_4 & a_5 \\ \nu & 4 & 4 & 0 & 0 & 0 \\ n_{\Gamma,1} & 1 & 2 & 0 & 0 & 0 \\ n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 \\ n_{Y,1} & 1 & 0 & 0 & 2 & 0 \\ n_{Y,2} & 1 & 2 & 0 & -2 & 0 \\ n_{Z,1} & 1 & 0 & 2 & 0 & 0 \\ n_{Z,2} & 1 & 2 & -2 & 0 & 0 \\ n_{T,1} & 1 & 2 & -2 & -2 & 4 \\ n_{T,2} & 1 & 0 & 2 & 2 & -4 \\ n_{S,1} & 1 & 1 & 0 & 0 & 0 \\ n_{R,1} & 1 & 1 & 0 & 0 & 0 \end{pmatrix} \tag{68}$$

$$\begin{pmatrix} \text{SG68} & a_1 & a_2 & a_3 \\ \nu & 4 & 8 & 0 \\ n_{\Gamma,1} & 1 & 4 & 0 \\ n_{\Gamma,2} & 1 & 0 & 0 \\ n_{\Upsilon,1} & 1 & 0 & 4 \\ n_{\Upsilon,2} & 1 & 4 & -4 \\ n_{\text{Z},1} & 1 & 2 & 0 \\ n_{\text{Z},2} & 1 & 2 & 0 \\ n_{\text{T},1} & 1 & 2 & 0 \\ n_{\text{T},2} & 1 & 2 & 0 \\ n_{\text{S},1} & 1 & 2 & 0 \\ n_{\text{R},1} & 1 & 2 & 0 \end{pmatrix} \tag{69}$$

$$\begin{pmatrix} \text{SG69} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\ \nu & 4 & 4 & -6 & 0 & 8 & -8 \\ n_{\Gamma,1} & 1 & 2 & -3 & 0 & 4 & -4 \\ n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{\Upsilon,1} & 1 & 0 & -1 & 0 & 2 & -4 \\ n_{\Upsilon,2} & 1 & 2 & -2 & 0 & 2 & 0 \\ n_{\text{X},1} & 1 & 0 & -1 & 2 & 2 & -4 \\ n_{\text{X},2} & 1 & 2 & -2 & -2 & 2 & 0 \\ n_{\text{Z},1} & 1 & 2 & -3 & -2 & 4 & 0 \\ n_{\text{Z},2} & 1 & 0 & 0 & 2 & 0 & -4 \\ n_{\text{L},1} & 1 & 1 & 0 & 0 & 0 & 0 \\ n_{\text{L},2} & 1 & 1 & -3 & 0 & 4 & -4 \end{pmatrix} \tag{70}$$

$$\begin{pmatrix} \text{SG70} & a_1 & a_2 & a_3 \\ \nu & 4 & 8 & -16 \\ n_{\Gamma,1} & 1 & 4 & -8 \\ n_{\Gamma,2} & 1 & 0 & 0 \\ n_{\Upsilon,1} & 1 & 2 & -4 \\ n_{\Upsilon,2} & 1 & 2 & -4 \\ n_{\text{X},1} & 1 & 2 & -4 \\ n_{\text{X},2} & 1 & 2 & -4 \\ n_{\text{Z},1} & 1 & 2 & -4 \\ n_{\text{Z},2} & 1 & 2 & -4 \\ n_{\text{L},1} & 1 & 1 & 0 \\ n_{\text{L},2} & 1 & 3 & -8 \end{pmatrix} \tag{71}$$

$$\begin{pmatrix}
 \text{SG71} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 4 & -10 & 2 & 2 & 8 & -24 \\
 n_{\Gamma,1} & 1 & -5 & 1 & 1 & 4 & -12 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{X,1} & 1 & -5 & 1 & 1 & 4 & -8 \\
 n_{X,2} & 1 & 0 & 0 & 0 & 0 & -4 \\
 n_{R,1} & 1 & -1 & 1 & 0 & 0 & -4 \\
 n_{R,2} & 1 & -1 & 1 & 0 & 0 & -4 \\
 n_{R,3} & 1 & -4 & 0 & 1 & 4 & -8 \\
 n_{R,4} & 1 & -4 & 0 & 1 & 4 & -8 \\
 n_{S,1} & 1 & -1 & 0 & 0 & 2 & -4 \\
 n_{S,2} & 1 & -1 & 0 & 0 & 2 & -4 \\
 n_{S,3} & 1 & -4 & 1 & 1 & 2 & -8 \\
 n_{S,4} & 1 & -4 & 1 & 1 & 2 & -8 \\
 n_{T,1} & 1 & -1 & 0 & 1 & 0 & -4 \\
 n_{T,2} & 1 & -1 & 0 & 1 & 0 & -4 \\
 n_{T,3} & 1 & -4 & 1 & 0 & 4 & -8 \\
 n_{T,4} & 1 & -4 & 1 & 0 & 4 & -8 \\
 n_{W,1} & 2 & -5 & 1 & 1 & 4 & -12
 \end{pmatrix} \tag{72}$$

$$\begin{pmatrix}
 \text{SG72} & a_1 & a_2 & a_3 & a_4 \\
 \nu & 4 & -4 & 8 & -16 \\
 n_{\Gamma,1} & 1 & -2 & 4 & -8 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 0 \\
 n_{X,1} & 1 & -2 & 4 & -4 \\
 n_{X,2} & 1 & 0 & 0 & -4 \\
 n_{R,1} & 1 & -1 & 2 & -4 \\
 n_{S,1} & 1 & -1 & 2 & -4 \\
 n_{T,1} & 1 & 2 & -2 & 0 \\
 n_{T,2} & 1 & 2 & -2 & 0 \\
 n_{T,3} & 1 & -4 & 6 & -8 \\
 n_{T,4} & 1 & -4 & 6 & -8 \\
 n_{W,1} & 1 & -1 & 2 & -4
 \end{pmatrix} \tag{73}$$

$$\begin{pmatrix}
 \text{SG73} & a_1 & a_2 & a_3 \\
 \nu & 8 & 0 & 0 \\
 n_{\Gamma,1} & 2 & 2 & 0 \\
 n_{\Gamma,2} & 2 & -2 & 0 \\
 n_{X,1} & 2 & 2 & -4 \\
 n_{X,2} & 2 & -2 & 4 \\
 n_{R,1} & 2 & 0 & 0 \\
 n_{S,1} & 2 & 0 & 0 \\
 n_{T,1} & 2 & 0 & 0 \\
 n_{W,1} & 1 & 0 & 0 \\
 n_{W,2} & 1 & 0 & 0 \\
 n_{W,3} & 1 & 0 & 0 \\
 n_{W,4} & 1 & 0 & 0
 \end{pmatrix} \tag{74}$$

$$\begin{pmatrix}
 \text{SG74} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 4 & 4 & -12 & 16 & -16 \\
 n_{\Gamma,1} & 1 & 2 & -6 & 8 & -8 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 \\
 n_{X,1} & 1 & 2 & -4 & 4 & -4 \\
 n_{X,2} & 1 & 0 & -2 & 4 & -4 \\
 n_{R,1} & 1 & 1 & -6 & 8 & -8 \\
 n_{R,2} & 1 & 1 & -6 & 8 & -8 \\
 n_{R,3} & 1 & 1 & 0 & 0 & 0 \\
 n_{R,4} & 1 & 1 & 0 & 0 & 0 \\
 n_{S,1} & 1 & 0 & -1 & 2 & -4 \\
 n_{S,2} & 1 & 0 & -1 & 2 & -4 \\
 n_{S,3} & 1 & 2 & -5 & 6 & -4 \\
 n_{S,4} & 1 & 2 & -5 & 6 & -4 \\
 n_{T,1} & 1 & 1 & -3 & 4 & -4 \\
 n_{W,1} & 1 & 1 & -3 & 4 & -4 \\
 n_{W,2} & 1 & 1 & -3 & 4 & -4 \\
 n_{W,3} & 1 & 1 & -3 & 4 & -4 \\
 n_{W,4} & 1 & 1 & -3 & 4 & -4
 \end{pmatrix} \tag{75}$$

$$\begin{pmatrix}
 \text{SG75} & a_1 & a_2 & a_3 \\
 \nu & 4 & 2 & 2 \\
 n_{\Gamma,1} & 1 & 1 & 1 \\
 n_{\Gamma,2} & 1 & 0 & 0 \\
 n_{\Gamma,3} & 1 & 0 & 0 \\
 n_{\Gamma,4} & 1 & 1 & 1 \\
 n_{M,1} & 1 & 0 & 1 \\
 n_{M,2} & 1 & 1 & 0 \\
 n_{M,3} & 1 & 1 & 0 \\
 n_{M,4} & 1 & 0 & 1 \\
 n_{Z,1} & 1 & 1 & 1 \\
 n_{Z,2} & 1 & 0 & 0 \\
 n_{Z,3} & 1 & 0 & 0 \\
 n_{Z,4} & 1 & 1 & 1 \\
 n_{A,1} & 1 & 0 & 1 \\
 n_{A,2} & 1 & 1 & 0 \\
 n_{A,3} & 1 & 1 & 0 \\
 n_{A,4} & 1 & 0 & 1 \\
 n_{R,1} & 2 & 1 & 1 \\
 n_{R,2} & 2 & 1 & 1 \\
 n_{X,1} & 2 & 1 & 1 \\
 n_{X,2} & 2 & 1 & 1
 \end{pmatrix} \tag{76}$$

$$\begin{pmatrix} \text{SG76} & a_1 \\ \nu & 8 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\Gamma,3} & 2 \\ n_{\Gamma,4} & 2 \\ n_{\text{M},1} & 2 \\ n_{\text{M},2} & 2 \\ n_{\text{M},3} & 2 \\ n_{\text{M},4} & 2 \\ n_{\text{Z},1} & 1 \\ n_{\text{Z},2} & 2 \\ n_{\text{Z},3} & 1 \\ n_{\text{Z},4} & 2 \\ n_{\text{A},1} & 1 \\ n_{\text{A},2} & 2 \\ n_{\text{A},3} & 1 \\ n_{\text{A},4} & 2 \\ n_{\text{R},1} & 2 \\ n_{\text{R},2} & 2 \\ n_{\text{X},1} & 4 \\ n_{\text{X},2} & 4 \end{pmatrix} \tag{77}$$

$$\begin{pmatrix} \text{SG77} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\Gamma,3} & 1 \\ n_{\Gamma,4} & 1 \\ n_{\text{M},1} & 1 \\ n_{\text{M},2} & 1 \\ n_{\text{M},3} & 1 \\ n_{\text{M},4} & 1 \\ n_{\text{Z},1} & 1 \\ n_{\text{Z},2} & 1 \\ n_{\text{Z},3} & 1 \\ n_{\text{Z},4} & 1 \\ n_{\text{A},1} & 1 \\ n_{\text{A},2} & 1 \\ n_{\text{A},3} & 1 \\ n_{\text{A},4} & 1 \\ n_{\text{R},1} & 2 \\ n_{\text{R},2} & 2 \\ n_{\text{X},1} & 2 \\ n_{\text{X},2} & 2 \end{pmatrix} \tag{78}$$

$$\begin{pmatrix} \text{SG78} & a_1 \\ \nu & 8 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\Gamma,3} & 2 \\ n_{\Gamma,4} & 2 \\ n_{M,1} & 2 \\ n_{M,2} & 2 \\ n_{M,3} & 2 \\ n_{M,4} & 2 \\ n_{Z,1} & 1 \\ n_{Z,2} & 2 \\ n_{Z,3} & 1 \\ n_{Z,4} & 2 \\ n_{A,1} & 1 \\ n_{A,2} & 2 \\ n_{A,3} & 1 \\ n_{A,4} & 2 \\ n_{R,1} & 2 \\ n_{R,2} & 2 \\ n_{X,1} & 4 \\ n_{X,2} & 4 \end{pmatrix} \tag{79}$$

$$\begin{pmatrix} \text{SG79} & a_1 & a_2 \\ \nu & 4 & 2 \\ n_{\Gamma,1} & 1 & 1 \\ n_{\Gamma,2} & 1 & 0 \\ n_{\Gamma,3} & 1 & 0 \\ n_{\Gamma,4} & 1 & 1 \\ n_{N,1} & 2 & 1 \\ n_{X,1} & 2 & 1 \\ n_{X,2} & 2 & 1 \\ n_{Z,1} & 1 & 1 \\ n_{Z,2} & 1 & 0 \\ n_{Z,3} & 1 & 0 \\ n_{Z,4} & 1 & 1 \\ n_{P,1} & 2 & 1 \\ n_{P,2} & 2 & 1 \end{pmatrix} \tag{80}$$

$$\begin{pmatrix} \text{SG80} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\Gamma,3} & 1 \\ n_{\Gamma,4} & 1 \\ n_{N,1} & 2 \\ n_{X,1} & 2 \\ n_{X,2} & 2 \\ n_{Z,1} & 1 \\ n_{Z,2} & 1 \\ n_{Z,3} & 1 \\ n_{Z,4} & 1 \\ n_{P,1} & 2 \\ n_{P,2} & 1 \end{pmatrix} \tag{81}$$

$$\begin{pmatrix}
 \text{SG81} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 4 & 2 & 2 & 2 & -4 \\
 n_{\Gamma,1} & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 1 & 1 & 1 & -2 \\
 n_{\Gamma,3} & 1 & 1 & 1 & 1 & -2 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 \\
 n_{\text{M},1} & 1 & 1 & 1 & 0 & -2 \\
 n_{\text{M},2} & 1 & 0 & 0 & 1 & 0 \\
 n_{\text{M},3} & 1 & 0 & 0 & 1 & 0 \\
 n_{\text{M},4} & 1 & 1 & 1 & 0 & -2 \\
 n_{\text{Z},1} & 1 & 1 & 0 & 1 & -2 \\
 n_{\text{Z},2} & 1 & 0 & 1 & 0 & 0 \\
 n_{\text{Z},3} & 1 & 0 & 1 & 0 & 0 \\
 n_{\text{Z},4} & 1 & 1 & 0 & 1 & -2 \\
 n_{\text{A},1} & 1 & 0 & 1 & 1 & -2 \\
 n_{\text{A},2} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{A},3} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{A},4} & 1 & 0 & 1 & 1 & -2 \\
 n_{\text{R},1} & 2 & 1 & 1 & 1 & -2 \\
 n_{\text{R},2} & 2 & 1 & 1 & 1 & -2 \\
 n_{\text{X},1} & 2 & 1 & 1 & 1 & -2 \\
 n_{\text{X},2} & 2 & 1 & 1 & 1 & -2
 \end{pmatrix} \tag{82}$$

$$\begin{pmatrix}
 \text{SG82} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 4 & 2 & 2 & 2 & -4 \\
 n_{\Gamma,1} & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 1 & 1 & 1 & -2 \\
 n_{\Gamma,3} & 1 & 1 & 1 & 1 & -2 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 \\
 n_{\text{N},1} & 2 & 1 & 1 & 1 & -2 \\
 n_{\text{X},1} & 2 & 1 & 1 & 1 & -2 \\
 n_{\text{X},2} & 2 & 1 & 1 & 1 & -2 \\
 n_{\text{Z},1} & 1 & 1 & 1 & 0 & -2 \\
 n_{\text{Z},2} & 1 & 0 & 0 & 1 & 0 \\
 n_{\text{Z},3} & 1 & 0 & 0 & 1 & 0 \\
 n_{\text{Z},4} & 1 & 1 & 1 & 0 & -2 \\
 n_{\text{P},1} & 1 & 0 & 1 & 1 & -2 \\
 n_{\text{P},2} & 1 & 0 & 1 & 0 & 0 \\
 n_{\text{P},3} & 1 & 1 & 0 & 0 & 0 \\
 n_{\text{P},4} & 1 & 1 & 0 & 1 & -2
 \end{pmatrix} \tag{83}$$

$$\left(\begin{array}{r} \text{SG84} \\ \nu \\ n_{\Gamma,1} \\ n_{\Gamma,2} \\ n_{\Gamma,3} \\ n_{\Gamma,4} \\ n_{\Gamma,5} \\ n_{\Gamma,6} \\ n_{\Gamma,7} \\ n_{\Gamma,8} \\ n_{M,1} \\ n_{M,2} \\ n_{M,3} \\ n_{M,4} \\ n_{M,5} \\ n_{M,6} \\ n_{M,7} \\ n_{M,8} \\ n_{Z,1} \\ n_{Z,2} \\ n_{A,1} \\ n_{A,2} \\ n_{R,1} \\ n_{R,2} \\ n_{R,3} \\ n_{R,4} \\ n_{X,1} \\ n_{X,2} \\ n_{X,3} \\ n_{X,4} \end{array} \begin{array}{ccccccc} a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 \\ 8 & 4 & 4 & 4 & -28 & 32 & -32 \\ 1 & 1 & 1 & 1 & -7 & 8 & -8 \\ 1 & 0 & 0 & 1 & -3 & 4 & -4 \\ 1 & 0 & 0 & 1 & -3 & 4 & -4 \\ 1 & 1 & 1 & 1 & -7 & 8 & -8 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 0 & -4 & 4 & -4 \\ 1 & 1 & 1 & 0 & -4 & 4 & -4 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & -3 & 4 & -4 \\ 1 & 1 & 0 & 0 & -3 & 4 & -4 \\ 1 & 1 & 0 & 0 & -3 & 4 & -4 \\ 1 & 0 & 1 & 0 & -3 & 4 & -4 \\ 1 & 1 & 0 & 1 & -4 & 4 & -4 \\ 1 & 0 & 1 & 1 & -4 & 4 & -4 \\ 1 & 0 & 1 & 1 & -4 & 4 & -4 \\ 1 & 1 & 0 & 1 & -4 & 4 & -4 \\ 2 & 1 & 1 & 1 & -7 & 8 & -8 \\ 2 & 1 & 1 & 1 & -7 & 8 & -8 \\ 2 & 1 & 1 & 1 & -7 & 8 & -8 \\ 2 & 1 & 1 & 1 & -7 & 8 & -8 \\ 2 & 1 & 1 & 2 & -9 & 10 & -8 \\ 2 & 1 & 1 & 2 & -9 & 10 & -8 \\ 2 & 1 & 1 & 0 & -5 & 6 & -8 \\ 2 & 1 & 1 & 0 & -5 & 6 & -8 \\ 2 & 1 & 1 & 1 & -4 & 4 & -4 \\ 2 & 1 & 1 & 1 & -4 & 4 & -4 \\ 2 & 1 & 1 & 1 & -10 & 12 & -12 \\ 2 & 1 & 1 & 1 & -10 & 12 & -12 \end{array} \right)$$

(85)

$$\left(\begin{array}{r} \text{SG85} \\ \nu \\ n_{\Gamma,1} \\ n_{\Gamma,2} \\ n_{\Gamma,3} \\ n_{\Gamma,4} \\ n_{\Gamma,5} \\ n_{\Gamma,6} \\ n_{\Gamma,7} \\ n_{\Gamma,8} \\ n_{M,1} \\ n_{M,2} \\ n_{Z,1} \\ n_{Z,2} \\ n_{Z,3} \\ n_{Z,4} \\ n_{Z,5} \\ n_{Z,6} \\ n_{Z,7} \\ n_{Z,8} \\ n_{A,1} \\ n_{A,2} \\ n_{R,1} \\ n_{X,1} \end{array} \begin{array}{cccccc} a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\ 8 & 0 & 0 & 4 & 0 & -16 \\ 1 & 0 & 0 & 1 & 0 & -4 \\ 1 & 0 & -2 & 0 & 2 & -4 \\ 1 & 0 & -2 & 0 & 2 & -4 \\ 1 & 0 & 0 & 1 & 0 & -4 \\ 1 & 0 & 1 & 1 & -2 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & -2 & 0 \\ 2 & 0 & 0 & 1 & 0 & -4 \\ 2 & 0 & 0 & 1 & 0 & -4 \\ 1 & 1 & 3 & 1 & -4 & 0 \\ 1 & -1 & -1 & 0 & 2 & -4 \\ 1 & -1 & -1 & 0 & 2 & -4 \\ 1 & 1 & 3 & 1 & -4 & 0 \\ 1 & -1 & -2 & 1 & 2 & -4 \\ 1 & 1 & 0 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 & 0 & 0 \\ 1 & -1 & -2 & 1 & 2 & -4 \\ 2 & 0 & 0 & 1 & 0 & -4 \\ 2 & 0 & 0 & 1 & 0 & -4 \\ 2 & 0 & 0 & 1 & 0 & -4 \\ 2 & 0 & 0 & 1 & 0 & -4 \end{array} \right)$$

(86)

$$\begin{pmatrix}
 \text{SG86} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 8 & 0 & -4 & 8 & -16 \\
 n_{\Gamma,1} & 1 & 0 & -1 & 2 & -4 \\
 n_{\Gamma,2} & 1 & 0 & -2 & 2 & -4 \\
 n_{\Gamma,3} & 1 & 0 & -2 & 2 & -4 \\
 n_{\Gamma,4} & 1 & 0 & -1 & 2 & -4 \\
 n_{\Gamma,5} & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 1 & 0 & 1 & 0 & 0 \\
 n_{\Gamma,7} & 1 & 0 & 1 & 0 & 0 \\
 n_{\Gamma,8} & 1 & 0 & 0 & 0 & 0 \\
 n_{M,1} & 2 & 0 & -1 & 2 & -4 \\
 n_{M,2} & 2 & 0 & -1 & 2 & -4 \\
 n_{Z,1} & 2 & 0 & -1 & 2 & -4 \\
 n_{Z,2} & 2 & 0 & -1 & 2 & -4 \\
 n_{A,1} & 1 & 1 & 2 & -2 & 0 \\
 n_{A,2} & 1 & -1 & -1 & 2 & -4 \\
 n_{A,3} & 1 & -1 & -1 & 2 & -4 \\
 n_{A,4} & 1 & 1 & 2 & -2 & 0 \\
 n_{A,5} & 1 & -1 & -3 & 4 & -4 \\
 n_{A,6} & 1 & 1 & 0 & 0 & 0 \\
 n_{A,7} & 1 & 1 & 0 & 0 & 0 \\
 n_{A,8} & 1 & -1 & -3 & 4 & -4 \\
 n_{R,1} & 2 & 0 & -1 & 2 & -4 \\
 n_{X,1} & 2 & 0 & -1 & 2 & -4
 \end{pmatrix} \tag{87}$$

$$\begin{pmatrix}
 \text{SG87} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 \\
 \nu & 8 & -86 & 4 & 4 & 4 & 2 & 2 & 72 & -112 \\
 n_{\Gamma,1} & 1 & -17 & 1 & 1 & 1 & 1 & 0 & 14 & -24 \\
 n_{\Gamma,2} & 1 & -12 & 0 & 0 & 1 & 0 & 1 & 10 & -16 \\
 n_{\Gamma,3} & 1 & -12 & 0 & 0 & 1 & 0 & 1 & 10 & -16 \\
 n_{\Gamma,4} & 1 & -17 & 1 & 1 & 1 & 1 & 0 & 14 & -24 \\
 n_{\Gamma,5} & 1 & -7 & 1 & 0 & 0 & 0 & 0 & 6 & -8 \\
 n_{\Gamma,6} & 1 & -7 & 0 & 1 & 0 & 0 & 0 & 6 & -8 \\
 n_{\Gamma,7} & 1 & -7 & 0 & 1 & 0 & 0 & 0 & 6 & -8 \\
 n_{\Gamma,8} & 1 & -7 & 1 & 0 & 0 & 0 & 0 & 6 & -8 \\
 n_{N,1} & 2 & -18 & 1 & 1 & 1 & 0 & 0 & 16 & -24 \\
 n_{N,2} & 2 & -25 & 1 & 1 & 1 & 1 & 1 & 20 & -32 \\
 n_{X,1} & 2 & -25 & 1 & 1 & 0 & 1 & 1 & 22 & -32 \\
 n_{X,2} & 2 & -25 & 1 & 1 & 0 & 1 & 1 & 22 & -32 \\
 n_{X,3} & 2 & -18 & 1 & 1 & 2 & 0 & 0 & 14 & -24 \\
 n_{X,4} & 2 & -18 & 1 & 1 & 2 & 0 & 0 & 14 & -24 \\
 n_{Z,1} & 1 & -12 & 1 & 0 & 1 & 1 & 0 & 10 & -16 \\
 n_{Z,2} & 1 & -13 & 0 & 1 & 1 & 0 & 1 & 10 & -16 \\
 n_{Z,3} & 1 & -13 & 0 & 1 & 1 & 0 & 1 & 10 & -16 \\
 n_{Z,4} & 1 & -12 & 1 & 0 & 1 & 1 & 0 & 10 & -16 \\
 n_{Z,5} & 1 & -12 & 1 & 1 & 0 & 0 & 0 & 10 & -16 \\
 n_{Z,6} & 1 & -6 & 0 & 0 & 0 & 0 & 0 & 6 & -8 \\
 n_{Z,7} & 1 & -6 & 0 & 0 & 0 & 0 & 0 & 6 & -8 \\
 n_{Z,8} & 1 & -12 & 1 & 1 & 0 & 0 & 0 & 10 & -16 \\
 n_{P,1} & 2 & -18 & 1 & 1 & 1 & 1 & 0 & 14 & -24 \\
 n_{P,2} & 2 & -25 & 1 & 1 & 1 & 0 & 1 & 22 & -32 \\
 n_{P,3} & 2 & -25 & 1 & 1 & 1 & 0 & 1 & 22 & -32 \\
 n_{P,4} & 2 & -18 & 1 & 1 & 1 & 1 & 0 & 14 & -24
 \end{pmatrix} \tag{88}$$

$$\begin{pmatrix} \text{SG88} & a_1 & a_2 & a_3 & a_4 & a_5 \\ \nu & 8 & 8 & -8 & 4 & -16 \\ n_{\Gamma,1} & 1 & 2 & -2 & 1 & -4 \\ n_{\Gamma,2} & 1 & 2 & -2 & 0 & -4 \\ n_{\Gamma,3} & 1 & 2 & -2 & 0 & -4 \\ n_{\Gamma,4} & 1 & 2 & -2 & 1 & -4 \\ n_{\Gamma,5} & 1 & 0 & 0 & 0 & 0 \\ n_{\Gamma,6} & 1 & 0 & 0 & 1 & 0 \\ n_{\Gamma,7} & 1 & 0 & 0 & 1 & 0 \\ n_{\Gamma,8} & 1 & 0 & 0 & 0 & 0 \\ n_{\text{N},1} & 2 & 1 & -1 & 1 & -4 \\ n_{\text{N},2} & 2 & 3 & -3 & 1 & -4 \\ n_{\text{X},1} & 2 & 2 & -2 & 1 & -4 \\ n_{\text{Z},1} & 2 & 2 & -2 & 1 & -4 \\ n_{\text{Z},2} & 2 & 2 & -2 & 1 & -4 \\ n_{\text{P},1} & 2 & 2 & -2 & 1 & -4 \\ n_{\text{P},2} & 1 & 1 & 0 & 0 & 0 \\ n_{\text{P},3} & 2 & 2 & -2 & 1 & -4 \\ n_{\text{P},4} & 1 & 1 & -2 & 1 & -4 \end{pmatrix} \tag{89}$$

$$\begin{pmatrix} \text{SG89} & a_1 & a_2 & a_3 \\ \nu & 4 & 2 & 2 \\ n_{\Gamma,1} & 1 & 1 & 1 \\ n_{\Gamma,2} & 1 & 0 & 0 \\ n_{\text{M},1} & 1 & 0 & 1 \\ n_{\text{M},2} & 1 & 1 & 0 \\ n_{\text{Z},1} & 1 & 1 & 1 \\ n_{\text{Z},2} & 1 & 0 & 0 \\ n_{\text{A},1} & 1 & 0 & 1 \\ n_{\text{A},2} & 1 & 1 & 0 \\ n_{\text{R},1} & 2 & 1 & 1 \\ n_{\text{X},1} & 2 & 1 & 1 \end{pmatrix} \tag{90}$$

$$\begin{pmatrix} \text{SG90} & a_1 & a_2 \\ \nu & 4 & 4 \\ n_{\Gamma,1} & 1 & 2 \\ n_{\Gamma,2} & 1 & 0 \\ n_{\text{M},1} & 1 & 1 \\ n_{\text{M},2} & 1 & 1 \\ n_{\text{Z},1} & 1 & 2 \\ n_{\text{Z},2} & 1 & 0 \\ n_{\text{A},1} & 1 & 1 \\ n_{\text{A},2} & 1 & 1 \\ n_{\text{R},1} & 1 & 1 \\ n_{\text{R},2} & 1 & 1 \\ n_{\text{R},3} & 1 & 1 \\ n_{\text{R},4} & 1 & 1 \\ n_{\text{X},1} & 1 & 1 \\ n_{\text{X},2} & 1 & 1 \\ n_{\text{X},3} & 1 & 1 \\ n_{\text{X},4} & 1 & 1 \end{pmatrix} \tag{91}$$

$$\begin{pmatrix} \text{SG91} & a_1 \\ \nu & 8 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\text{M},1} & 2 \\ n_{\text{M},2} & 2 \\ n_{\text{Z},1} & 1 \\ n_{\text{Z},2} & 1 \\ n_{\text{Z},3} & 1 \\ n_{\text{Z},4} & 1 \\ n_{\text{Z},5} & 2 \\ n_{\text{A},1} & 1 \\ n_{\text{A},2} & 1 \\ n_{\text{A},3} & 1 \\ n_{\text{A},4} & 1 \\ n_{\text{A},5} & 2 \\ n_{\text{R},1} & 2 \\ n_{\text{R},2} & 2 \\ n_{\text{R},3} & 2 \\ n_{\text{R},4} & 2 \\ n_{\text{X},1} & 4 \end{pmatrix} \tag{92}$$

$$\begin{pmatrix} \text{SG92} & a_1 \\ \nu & 8 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\text{M},1} & 2 \\ n_{\text{M},2} & 2 \\ n_{\text{Z},1} & 1 \\ n_{\text{Z},2} & 1 \\ n_{\text{Z},3} & 1 \\ n_{\text{Z},4} & 1 \\ n_{\text{Z},5} & 2 \\ n_{\text{A},1} & 1 \\ n_{\text{A},2} & 1 \\ n_{\text{A},3} & 1 \\ n_{\text{A},4} & 1 \\ n_{\text{A},5} & 1 \\ n_{\text{R},1} & 2 \\ n_{\text{X},1} & 2 \\ n_{\text{X},2} & 2 \\ n_{\text{X},3} & 2 \\ n_{\text{X},4} & 2 \end{pmatrix} \tag{93}$$

$$\left(\begin{array}{cc} \text{SG93} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{M,1} & 1 \\ n_{M,2} & 1 \\ n_{Z,1} & 1 \\ n_{Z,2} & 1 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{R,1} & 2 \\ n_{X,1} & 2 \end{array} \right) \quad (94)$$

$$\left(\begin{array}{cc} \text{SG94} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{M,1} & 1 \\ n_{M,2} & 1 \\ n_{Z,1} & 1 \\ n_{Z,2} & 1 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{R,1} & 1 \\ n_{R,2} & 1 \\ n_{R,3} & 1 \\ n_{R,4} & 1 \\ n_{X,1} & 1 \\ n_{X,2} & 1 \\ n_{X,3} & 1 \\ n_{X,4} & 1 \end{array} \right) \quad (95)$$

$$\left(\begin{array}{cc} \text{SG95} & a_1 \\ \nu & 8 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{M,1} & 2 \\ n_{M,2} & 2 \\ n_{Z,1} & 1 \\ n_{Z,2} & 1 \\ n_{Z,3} & 1 \\ n_{Z,4} & 1 \\ n_{Z,5} & 2 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{A,3} & 1 \\ n_{A,4} & 1 \\ n_{A,5} & 2 \\ n_{R,1} & 2 \\ n_{R,2} & 2 \\ n_{R,3} & 2 \\ n_{R,4} & 2 \\ n_{X,1} & 4 \end{array} \right) \quad (96)$$

$$\begin{pmatrix} \text{SG96} & a_1 \\ \nu & 8 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{M,1} & 2 \\ n_{M,2} & 2 \\ n_{Z,1} & 1 \\ n_{Z,2} & 1 \\ n_{Z,3} & 1 \\ n_{Z,4} & 1 \\ n_{Z,5} & 2 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{A,3} & 1 \\ n_{A,4} & 1 \\ n_{A,5} & 1 \\ n_{R,1} & 2 \\ n_{X,1} & 2 \\ n_{X,2} & 2 \\ n_{X,3} & 2 \\ n_{X,4} & 2 \end{pmatrix} \tag{97}$$

$$\begin{pmatrix} \text{SG97} & a_1 & a_2 \\ \nu & 4 & 2 \\ n_{\Gamma,1} & 1 & 1 \\ n_{\Gamma,2} & 1 & 0 \\ n_{N,1} & 2 & 1 \\ n_{N,2} & 2 & 1 \\ n_{X,1} & 2 & 1 \\ n_{Z,1} & 1 & 1 \\ n_{Z,2} & 1 & 0 \\ n_{P,1} & 2 & 1 \end{pmatrix} \tag{98}$$

$$\begin{pmatrix} \text{SG98} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{N,1} & 2 \\ n_{N,2} & 2 \\ n_{X,1} & 2 \\ n_{Z,1} & 1 \\ n_{Z,2} & 1 \\ n_{P,1} & 1 \\ n_{P,2} & 1 \\ n_{P,3} & 1 \\ n_{P,4} & 1 \end{pmatrix} \tag{99}$$

$$\begin{pmatrix} \text{SG99} & a_1 & a_2 & a_3 \\ \nu & 4 & 2 & 2 \\ n_{\Gamma,1} & 1 & 1 & 1 \\ n_{\Gamma,2} & 1 & 0 & 0 \\ n_{\text{M},1} & 1 & 0 & 1 \\ n_{\text{M},2} & 1 & 1 & 0 \\ n_{\text{Z},1} & 1 & 1 & 1 \\ n_{\text{Z},2} & 1 & 0 & 0 \\ n_{\text{A},1} & 1 & 0 & 1 \\ n_{\text{A},2} & 1 & 1 & 0 \\ n_{\text{R},1} & 2 & 1 & 1 \\ n_{\text{X},1} & 2 & 1 & 1 \end{pmatrix} \tag{100}$$

$$\begin{pmatrix} \text{SG100} & a_1 & a_2 \\ \nu & 4 & 4 \\ n_{\Gamma,1} & 1 & 2 \\ n_{\Gamma,2} & 1 & 0 \\ n_{\text{M},1} & 1 & 1 \\ n_{\text{M},2} & 1 & 1 \\ n_{\text{Z},1} & 1 & 2 \\ n_{\text{Z},2} & 1 & 0 \\ n_{\text{A},1} & 1 & 1 \\ n_{\text{A},2} & 1 & 1 \\ n_{\text{R},1} & 1 & 1 \\ n_{\text{R},2} & 1 & 1 \\ n_{\text{R},3} & 1 & 1 \\ n_{\text{R},4} & 1 & 1 \\ n_{\text{X},1} & 1 & 1 \\ n_{\text{X},2} & 1 & 1 \\ n_{\text{X},3} & 1 & 1 \\ n_{\text{X},4} & 1 & 1 \end{pmatrix} \tag{101}$$

$$\begin{pmatrix} \text{SG101} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\text{M},1} & 1 \\ n_{\text{M},2} & 1 \\ n_{\text{Z},1} & 1 \\ n_{\text{Z},2} & 1 \\ n_{\text{A},1} & 1 \\ n_{\text{A},2} & 1 \\ n_{\text{R},1} & 1 \\ n_{\text{X},1} & 2 \end{pmatrix} \tag{102}$$

$$\begin{pmatrix} \text{SG102} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\text{M},1} & 1 \\ n_{\text{M},2} & 1 \\ n_{\text{Z},1} & 1 \\ n_{\text{Z},2} & 1 \\ n_{\text{A},1} & 1 \\ n_{\text{A},2} & 1 \\ n_{\text{R},1} & 1 \\ n_{\text{R},2} & 1 \\ n_{\text{R},3} & 1 \\ n_{\text{R},4} & 1 \\ n_{\text{X},1} & 1 \\ n_{\text{X},2} & 1 \\ n_{\text{X},3} & 1 \\ n_{\text{X},4} & 1 \end{pmatrix} \quad (103)$$

$$\begin{pmatrix} \text{SG103} & a_1 & a_2 & a_3 \\ \nu & 8 & 4 & 4 \\ n_{\Gamma,1} & 2 & 2 & 2 \\ n_{\Gamma,2} & 2 & 0 & 0 \\ n_{\text{M},1} & 2 & 0 & 2 \\ n_{\text{M},2} & 2 & 2 & 0 \\ n_{\text{Z},1} & 1 & 1 & 1 \\ n_{\text{Z},2} & 1 & 0 & 0 \\ n_{\text{A},1} & 1 & 0 & 1 \\ n_{\text{A},2} & 1 & 1 & 0 \\ n_{\text{R},1} & 2 & 1 & 1 \\ n_{\text{X},1} & 4 & 2 & 2 \end{pmatrix} \quad (104)$$

$$\begin{pmatrix} \text{SG104} & a_1 & a_2 \\ \nu & 8 & 4 \\ n_{\Gamma,1} & 2 & 2 \\ n_{\Gamma,2} & 2 & 0 \\ n_{\text{M},1} & 2 & 1 \\ n_{\text{M},2} & 2 & 1 \\ n_{\text{Z},1} & 1 & 1 \\ n_{\text{Z},2} & 1 & 0 \\ n_{\text{A},1} & 2 & 1 \\ n_{\text{A},2} & 2 & 1 \\ n_{\text{R},1} & 2 & 1 \\ n_{\text{R},2} & 2 & 1 \\ n_{\text{R},3} & 2 & 1 \\ n_{\text{R},4} & 2 & 1 \\ n_{\text{X},1} & 2 & 1 \\ n_{\text{X},2} & 2 & 1 \\ n_{\text{X},3} & 2 & 1 \\ n_{\text{X},4} & 2 & 1 \end{pmatrix} \quad (105)$$

$$\left(\begin{array}{cc} \text{SG105} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{M,1} & 1 \\ n_{M,2} & 1 \\ n_{Z,1} & 1 \\ n_{Z,2} & 1 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{R,1} & 2 \\ n_{X,1} & 2 \end{array} \right) \quad (106)$$

$$\left(\begin{array}{cc} \text{SG106} & a_1 \\ \nu & 8 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{M,1} & 2 \\ n_{M,2} & 2 \\ n_{Z,1} & 2 \\ n_{Z,2} & 2 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{R,1} & 2 \\ n_{R,2} & 2 \\ n_{R,3} & 2 \\ n_{R,4} & 2 \\ n_{X,1} & 2 \\ n_{X,2} & 2 \\ n_{X,3} & 2 \\ n_{X,4} & 2 \end{array} \right) \quad (107)$$

$$\left(\begin{array}{ccc} \text{SG107} & a_1 & a_2 \\ \nu & 4 & 2 \\ n_{\Gamma,1} & 1 & 1 \\ n_{\Gamma,2} & 1 & 0 \\ n_{N,1} & 2 & 1 \\ n_{N,2} & 2 & 1 \\ n_{X,1} & 2 & 1 \\ n_{Z,1} & 1 & 1 \\ n_{Z,2} & 1 & 0 \\ n_{P,1} & 2 & 1 \end{array} \right) \quad (108)$$

$$\left(\begin{array}{ccc} \text{SG108} & a_1 & a_2 \\ \nu & 4 & 4 \\ n_{\Gamma,1} & 1 & 2 \\ n_{\Gamma,2} & 1 & 0 \\ n_{N,1} & 1 & 1 \\ n_{N,2} & 1 & 1 \\ n_{X,1} & 2 & 2 \\ n_{Z,1} & 1 & 2 \\ n_{Z,2} & 1 & 0 \\ n_{P,1} & 1 & 1 \end{array} \right) \quad (109)$$

$$\begin{pmatrix} \text{SG109} & a_1 \\ \nu & 4 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\text{N},1} & 2 \\ n_{\text{N},2} & 2 \\ n_{\text{X},1} & 1 \\ n_{\text{X},2} & 1 \\ n_{\text{X},3} & 1 \\ n_{\text{X},4} & 1 \\ n_{\text{Z},1} & 1 \\ n_{\text{Z},2} & 1 \\ n_{\text{P},1} & 1 \\ n_{\text{P},2} & 1 \\ n_{\text{P},3} & 1 \\ n_{\text{P},4} & 1 \end{pmatrix} \tag{110}$$

$$\begin{pmatrix} \text{SG110} & a_1 \\ \nu & 8 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\text{N},1} & 2 \\ n_{\text{N},2} & 2 \\ n_{\text{X},1} & 2 \\ n_{\text{X},2} & 2 \\ n_{\text{X},3} & 2 \\ n_{\text{X},4} & 2 \\ n_{\text{Z},1} & 2 \\ n_{\text{Z},2} & 2 \\ n_{\text{P},1} & 2 \\ n_{\text{P},2} & 2 \\ n_{\text{P},3} & 1 \\ n_{\text{P},4} & 1 \end{pmatrix} \tag{111}$$

$$\begin{pmatrix} \text{SG111} & a_1 & a_2 & a_3 & a_4 & a_5 \\ \nu & 4 & 2 & 2 & 2 & -4 \\ n_{\Gamma,1} & 1 & 0 & 0 & 0 & 0 \\ n_{\Gamma,2} & 1 & 1 & 1 & 1 & -2 \\ n_{\text{M},1} & 1 & 1 & 0 & 1 & -2 \\ n_{\text{M},2} & 1 & 0 & 1 & 0 & 0 \\ n_{\text{Z},1} & 1 & 0 & 1 & 1 & -2 \\ n_{\text{Z},2} & 1 & 1 & 0 & 0 & 0 \\ n_{\text{A},1} & 1 & 1 & 1 & 0 & -2 \\ n_{\text{A},2} & 1 & 0 & 0 & 1 & 0 \\ n_{\text{R},1} & 2 & 1 & 1 & 1 & -2 \\ n_{\text{X},1} & 2 & 1 & 1 & 1 & -2 \end{pmatrix} \tag{112}$$

$$\begin{pmatrix}
 \text{SG112} & a_1 & a_2 & a_3 \\
 \nu & 4 & 4 & 0 \\
 n_{\Gamma,1} & 1 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 2 & 0 \\
 n_{M,1} & 1 & 2 & -2 \\
 n_{M,2} & 1 & 0 & 2 \\
 n_{Z,1} & 1 & 1 & 0 \\
 n_{Z,2} & 1 & 1 & 0 \\
 n_{A,1} & 1 & 1 & 0 \\
 n_{A,2} & 1 & 1 & 0 \\
 n_{R,1} & 2 & 2 & 0 \\
 n_{X,1} & 2 & 2 & 0
 \end{pmatrix} \tag{113}$$

$$\begin{pmatrix}
 \text{SG113} & a_1 & a_2 & a_3 \\
 \nu & 4 & 4 & 0 \\
 n_{\Gamma,1} & 1 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 2 & 0 \\
 n_{M,1} & 1 & 1 & 0 \\
 n_{M,2} & 1 & 1 & 0 \\
 n_{Z,1} & 1 & 2 & -2 \\
 n_{Z,2} & 1 & 0 & 2 \\
 n_{A,1} & 1 & 1 & 0 \\
 n_{A,2} & 1 & 1 & 0 \\
 n_{R,1} & 1 & 1 & 0 \\
 n_{R,2} & 1 & 1 & 0 \\
 n_{R,3} & 1 & 1 & 0 \\
 n_{R,4} & 1 & 1 & 0 \\
 n_{X,1} & 1 & 1 & 0 \\
 n_{X,2} & 1 & 1 & 0 \\
 n_{X,3} & 1 & 1 & 0 \\
 n_{X,4} & 1 & 1 & 0
 \end{pmatrix} \tag{114}$$

$$\begin{pmatrix}
 \text{SG114} & a_1 & a_2 & a_3 \\
 \nu & 8 & 4 & -8 \\
 n_{\Gamma,1} & 2 & 0 & -2 \\
 n_{\Gamma,2} & 2 & 2 & -2 \\
 n_{M,1} & 2 & 1 & -2 \\
 n_{M,2} & 2 & 1 & -2 \\
 n_{Z,1} & 2 & 1 & -2 \\
 n_{Z,2} & 2 & 1 & -2 \\
 n_{A,1} & 1 & 1 & -2 \\
 n_{A,2} & 1 & 0 & 0 \\
 n_{R,1} & 2 & 1 & -2 \\
 n_{R,2} & 2 & 1 & -2 \\
 n_{R,3} & 2 & 1 & -2 \\
 n_{R,4} & 2 & 1 & -2 \\
 n_{X,1} & 2 & 1 & -2 \\
 n_{X,2} & 2 & 1 & -2 \\
 n_{X,3} & 2 & 1 & -2 \\
 n_{X,4} & 2 & 1 & -2
 \end{pmatrix} \tag{115}$$

$$\begin{pmatrix}
 \text{SG115} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 4 & 2 & 2 & 2 & -4 \\
 n_{\Gamma,1} & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 1 & 1 & 1 & -2 \\
 n_{M,1} & 1 & 0 & 1 & 1 & -2 \\
 n_{M,2} & 1 & 1 & 0 & 0 & 0 \\
 n_{Z,1} & 1 & 1 & 1 & 0 & -2 \\
 n_{Z,2} & 1 & 0 & 0 & 1 & 0 \\
 n_{A,1} & 1 & 1 & 0 & 1 & -2 \\
 n_{A,2} & 1 & 0 & 1 & 0 & 0 \\
 n_{R,1} & 2 & 1 & 1 & 1 & -2 \\
 n_{X,1} & 2 & 1 & 1 & 1 & -2
 \end{pmatrix} \tag{116}$$

$$\begin{pmatrix}
 \text{SG116} & a_1 & a_2 & a_3 \\
 \nu & 4 & 4 & 0 \\
 n_{\Gamma,1} & 1 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 2 & 0 \\
 n_{M,1} & 1 & 2 & -2 \\
 n_{M,2} & 1 & 0 & 2 \\
 n_{Z,1} & 1 & 1 & 0 \\
 n_{Z,2} & 1 & 1 & 0 \\
 n_{A,1} & 1 & 1 & 0 \\
 n_{A,2} & 1 & 1 & 0 \\
 n_{R,1} & 1 & 1 & 0 \\
 n_{X,1} & 2 & 2 & 0
 \end{pmatrix} \tag{117}$$

$$\begin{pmatrix}
 \text{SG117} & a_1 & a_2 & a_3 \\
 \nu & 4 & 4 & 0 \\
 n_{\Gamma,1} & 1 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 2 & 0 \\
 n_{M,1} & 1 & 1 & 0 \\
 n_{M,2} & 1 & 1 & 0 \\
 n_{Z,1} & 1 & 2 & -2 \\
 n_{Z,2} & 1 & 0 & 2 \\
 n_{A,1} & 1 & 1 & 0 \\
 n_{A,2} & 1 & 1 & 0 \\
 n_{R,1} & 1 & 1 & 0 \\
 n_{R,2} & 1 & 1 & 0 \\
 n_{R,3} & 1 & 1 & 0 \\
 n_{R,4} & 1 & 1 & 0 \\
 n_{X,1} & 1 & 1 & 0 \\
 n_{X,2} & 1 & 1 & 0 \\
 n_{X,3} & 1 & 1 & 0 \\
 n_{X,4} & 1 & 1 & 0
 \end{pmatrix} \tag{118}$$

$$\begin{pmatrix} \text{SG118} & a_1 & a_2 & a_3 \\ \nu & 4 & 4 & 0 \\ n_{\Gamma,1} & 1 & 0 & 0 \\ n_{\Gamma,2} & 1 & 2 & 0 \\ n_{M,1} & 1 & 1 & 0 \\ n_{M,2} & 1 & 1 & 0 \\ n_{Z,1} & 1 & 1 & 0 \\ n_{Z,2} & 1 & 1 & 0 \\ n_{A,1} & 1 & 2 & -2 \\ n_{A,2} & 1 & 0 & 2 \\ n_{R,1} & 1 & 1 & 0 \\ n_{R,2} & 1 & 1 & 0 \\ n_{R,3} & 1 & 1 & 0 \\ n_{R,4} & 1 & 1 & 0 \\ n_{X,1} & 1 & 1 & 0 \\ n_{X,2} & 1 & 1 & 0 \\ n_{X,3} & 1 & 1 & 0 \\ n_{X,4} & 1 & 1 & 0 \end{pmatrix} \tag{119}$$

$$\begin{pmatrix} \text{SG119} & a_1 & a_2 & a_3 & a_4 & a_5 \\ \nu & 4 & 2 & 2 & 2 & -4 \\ n_{\Gamma,1} & 1 & 0 & 0 & 0 & 0 \\ n_{\Gamma,2} & 1 & 1 & 1 & 1 & -2 \\ n_{N,1} & 2 & 1 & 1 & 1 & -2 \\ n_{N,2} & 2 & 1 & 1 & 1 & -2 \\ n_{X,1} & 2 & 1 & 1 & 1 & -2 \\ n_{Z,1} & 1 & 1 & 1 & 0 & -2 \\ n_{Z,2} & 1 & 0 & 0 & 1 & 0 \\ n_{P,1} & 1 & 0 & 1 & 1 & -2 \\ n_{P,2} & 1 & 0 & 1 & 0 & 0 \\ n_{P,3} & 1 & 1 & 0 & 0 & 0 \\ n_{P,4} & 1 & 1 & 0 & 1 & -2 \end{pmatrix} \tag{120}$$

$$\begin{pmatrix} \text{SG120} & a_1 & a_2 & a_3 \\ \nu & 4 & 4 & 0 \\ n_{\Gamma,1} & 1 & 0 & 0 \\ n_{\Gamma,2} & 1 & 2 & 0 \\ n_{N,1} & 1 & 1 & 0 \\ n_{N,2} & 1 & 1 & 0 \\ n_{X,1} & 2 & 2 & 0 \\ n_{Z,1} & 1 & 2 & -2 \\ n_{Z,2} & 1 & 0 & 2 \\ n_{P,1} & 1 & 1 & 0 \\ n_{P,2} & 1 & 1 & 0 \\ n_{P,3} & 1 & 1 & 0 \\ n_{P,4} & 1 & 1 & 0 \end{pmatrix} \tag{121}$$

$$\begin{pmatrix} \text{SG121} & a_1 & a_2 & a_3 & a_4 \\ \nu & 4 & 4 & 2 & -4 \\ n_{\Gamma,1} & 1 & 0 & 0 & 0 \\ n_{\Gamma,2} & 1 & 2 & 1 & -2 \\ n_{\text{N},1} & 2 & 2 & 1 & -2 \\ n_{\text{N},2} & 2 & 2 & 1 & -2 \\ n_{\text{X},1} & 2 & 2 & 1 & -2 \\ n_{\text{Z},1} & 1 & 2 & 0 & -2 \\ n_{\text{Z},2} & 1 & 0 & 1 & 0 \\ n_{\text{P},1} & 1 & 1 & 1 & -2 \\ n_{\text{P},2} & 1 & 1 & 0 & 0 \end{pmatrix} \quad (122)$$

$$\begin{pmatrix} \text{SG122} & a_1 & a_2 & a_3 \\ \nu & 8 & 4 & -8 \\ n_{\Gamma,1} & 2 & 0 & -2 \\ n_{\Gamma,2} & 2 & 2 & -2 \\ n_{\text{N},1} & 4 & 2 & -4 \\ n_{\text{N},2} & 4 & 2 & -4 \\ n_{\text{X},1} & 2 & 1 & -2 \\ n_{\text{X},2} & 2 & 1 & -2 \\ n_{\text{X},3} & 2 & 1 & -2 \\ n_{\text{X},4} & 2 & 1 & -2 \\ n_{\text{Z},1} & 2 & 1 & -2 \\ n_{\text{Z},2} & 2 & 1 & -2 \\ n_{\text{P},1} & 1 & 1 & -2 \\ n_{\text{P},2} & 1 & 1 & -2 \\ n_{\text{P},3} & 1 & 0 & 0 \\ n_{\text{P},4} & 1 & 0 & 0 \\ n_{\text{P},5} & 2 & 1 & -2 \end{pmatrix} \quad (123)$$

$$\begin{pmatrix} \text{SG123} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 & a_{10} & a_{11} & a_{12} & a_{13} \\ \nu & 8 & 4 & 4 & 4 & 4 & 2 & 2 & 2 & -48 & 2 & 8 & 40 & 0 \\ n_{\Gamma,1} & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & -14 & 1 & 2 & 12 & 0 \\ n_{\Gamma,2} & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & -6 & 0 & 2 & 4 & 0 \\ n_{\Gamma,3} & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & -4 & 0 & 0 & 4 & 0 \\ n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{\text{M},1} & 1 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & -6 & 1 & -2 & 8 & 0 \\ n_{\text{M},2} & 1 & 1 & 0 & 0 & 0 & 1 & 0 & 1 & -6 & 0 & 2 & 4 & 0 \\ n_{\text{M},3} & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & -6 & 0 & 2 & 4 & 0 \\ n_{\text{M},4} & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & -6 & 0 & 2 & 4 & 0 \\ n_{\text{Z},1} & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & -5 & 0 & 2 & 4 & 0 \\ n_{\text{Z},2} & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{\text{Z},3} & 1 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & -13 & 1 & 0 & 12 & 0 \\ n_{\text{Z},4} & 1 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & -6 & 0 & 2 & 4 & 0 \\ n_{\text{A},1} & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & -11 & 0 & 0 & 12 & -8 \\ n_{\text{A},2} & 1 & 1 & 0 & 0 & 1 & 0 & 0 & 1 & -6 & 0 & 2 & 4 & 0 \\ n_{\text{A},3} & 1 & 0 & 1 & 1 & 0 & 0 & 1 & 0 & -1 & 1 & 0 & 0 & 8 \\ n_{\text{A},4} & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & -6 & 0 & 2 & 4 & 0 \\ n_{\text{R},1} & 2 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & -15 & 0 & 4 & 12 & 0 \\ n_{\text{R},2} & 2 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & -9 & 1 & 0 & 8 & 0 \\ n_{\text{X},1} & 2 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & -8 & 1 & 0 & 8 & 0 \\ n_{\text{X},2} & 2 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & -16 & 0 & 4 & 12 & 0 \end{pmatrix} \quad (124)$$

$$\begin{pmatrix}
 \text{SG124} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 \\
 \nu & 8 & 4 & 4 & 8 & 4 & -36 & 40 & -32 \\
 n_{\Gamma,1} & 1 & 1 & 1 & 2 & 2 & -10 & 12 & -8 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 2 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 1 & 1 & 1 & 0 & 0 & -8 & 8 & -8 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{M,1} & 1 & 0 & 1 & 0 & 0 & -12 & 14 & -16 \\
 n_{M,2} & 1 & 1 & 0 & 0 & 2 & -2 & 2 & 0 \\
 n_{M,3} & 1 & 0 & 1 & 2 & 0 & -2 & 2 & 0 \\
 n_{M,4} & 1 & 1 & 0 & 2 & 0 & -2 & 2 & 0 \\
 n_{Z,1} & 1 & 1 & 1 & 1 & 1 & -9 & 10 & -8 \\
 n_{Z,2} & 1 & 1 & 1 & 1 & 1 & -9 & 10 & -8 \\
 n_{Z,3} & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\
 n_{Z,4} & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\
 n_{A,1} & 1 & 0 & 1 & 1 & 0 & -7 & 8 & -8 \\
 n_{A,2} & 1 & 0 & 1 & 1 & 0 & -7 & 8 & -8 \\
 n_{A,3} & 1 & 1 & 0 & 1 & 1 & -2 & 2 & 0 \\
 n_{A,4} & 1 & 1 & 0 & 1 & 1 & -2 & 2 & 0 \\
 n_{R,1} & 2 & 1 & 1 & 2 & 1 & -9 & 10 & -8 \\
 n_{R,2} & 2 & 1 & 1 & 2 & 1 & -9 & 10 & -8 \\
 n_{X,1} & 2 & 1 & 1 & 2 & 0 & -8 & 10 & -8 \\
 n_{X,2} & 2 & 1 & 1 & 2 & 2 & -10 & 10 & -8
 \end{pmatrix}
 \tag{125}$$

$$\begin{pmatrix}
 \text{SG125} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 8 & 4 & 0 & -4 & 8 & -16 \\
 n_{\Gamma,1} & 1 & 1 & 0 & -1 & 2 & -4 \\
 n_{\Gamma,2} & 1 & 0 & 0 & -2 & 2 & -4 \\
 n_{\Gamma,3} & 1 & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 1 & 0 & 0 \\
 n_{M,1} & 2 & 1 & 0 & -1 & 2 & -4 \\
 n_{Z,1} & 1 & 1 & 1 & 2 & -2 & 0 \\
 n_{Z,2} & 1 & 0 & -1 & -1 & 2 & -4 \\
 n_{Z,3} & 1 & 1 & -1 & -3 & 4 & -4 \\
 n_{Z,4} & 1 & 0 & 1 & 0 & 0 & 0 \\
 n_{A,1} & 2 & 1 & 0 & -1 & 2 & -4 \\
 n_{R,1} & 2 & 1 & 0 & -1 & 2 & -4 \\
 n_{R,2} & 2 & 1 & 0 & -1 & 2 & -4 \\
 n_{X,1} & 2 & 1 & 0 & -1 & 2 & -4 \\
 n_{X,2} & 2 & 1 & 0 & -1 & 2 & -4
 \end{pmatrix}
 \tag{126}$$

$$\begin{pmatrix}
 \text{SG126} & a_1 & a_2 & a_3 & a_4 \\
 \nu & 8 & 8 & 4 & 0 \\
 n_{\Gamma,1} & 1 & 2 & 1 & 0 \\
 n_{\Gamma,2} & 1 & 0 & 0 & -4 \\
 n_{\Gamma,3} & 1 & 0 & 1 & 0 \\
 n_{\Gamma,4} & 1 & 2 & 0 & 4 \\
 n_{\text{M},1} & 2 & 2 & 1 & 0 \\
 n_{\text{Z},1} & 1 & 1 & 1 & 0 \\
 n_{\text{Z},2} & 1 & 1 & 1 & 0 \\
 n_{\text{Z},3} & 1 & 1 & 0 & 0 \\
 n_{\text{Z},4} & 1 & 1 & 0 & 0 \\
 n_{\text{A},1} & 2 & 2 & 1 & 0 \\
 n_{\text{R},1} & 2 & 2 & 1 & 0 \\
 n_{\text{R},2} & 2 & 2 & 1 & 0 \\
 n_{\text{X},1} & 2 & 2 & 1 & 0 \\
 n_{\text{X},2} & 2 & 2 & 1 & 0
 \end{pmatrix}
 \tag{127}$$

$$\begin{pmatrix}
 \text{SG127} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 \\
 \nu & 8 & 8 & 4 & 4 & 4 & -28 & 32 & 0 \\
 n_{\Gamma,1} & 1 & 2 & 1 & 1 & 2 & -10 & 12 & 0 \\
 n_{\Gamma,2} & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 1 & 2 & 0 & 0 & 0 & -4 & 4 & 0 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\text{M},1} & 1 & 1 & 1 & 1 & 0 & -4 & 4 & 0 \\
 n_{\text{M},2} & 1 & 1 & 1 & 1 & 0 & -4 & 4 & 0 \\
 n_{\text{M},3} & 1 & 1 & 0 & 0 & 1 & -3 & 4 & 0 \\
 n_{\text{M},4} & 1 & 1 & 0 & 0 & 1 & -3 & 4 & 0 \\
 n_{\text{Z},1} & 1 & 2 & 1 & 0 & 0 & -10 & 12 & -8 \\
 n_{\text{Z},2} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\text{Z},3} & 1 & 2 & 0 & 1 & 2 & -4 & 4 & 8 \\
 n_{\text{Z},4} & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\
 n_{\text{A},1} & 1 & 1 & 1 & 0 & 1 & -4 & 4 & 0 \\
 n_{\text{A},2} & 1 & 1 & 1 & 0 & 1 & -4 & 4 & 0 \\
 n_{\text{A},3} & 1 & 1 & 0 & 1 & 0 & -3 & 4 & 0 \\
 n_{\text{A},4} & 1 & 1 & 0 & 1 & 0 & -3 & 4 & 0 \\
 n_{\text{R},1} & 2 & 2 & 1 & 1 & 1 & -7 & 8 & 0 \\
 n_{\text{R},2} & 2 & 2 & 1 & 1 & 1 & -7 & 8 & 0 \\
 n_{\text{X},1} & 2 & 2 & 1 & 1 & 1 & -7 & 8 & 0 \\
 n_{\text{X},2} & 2 & 2 & 1 & 1 & 1 & -7 & 8 & 0
 \end{pmatrix}
 \tag{128}$$

$$\begin{pmatrix}
 \text{SG128} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 \\
 \nu & 8 & 8 & 8 & 4 & 4 & 4 & -96 \\
 n_{\Gamma,1} & 1 & 2 & 2 & 2 & 0 & 2 & -24 \\
 n_{\Gamma,2} & 1 & 0 & 2 & 0 & 2 & 0 & -16 \\
 n_{\Gamma,3} & 1 & 2 & 0 & 0 & 0 & 0 & -8 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\text{M},1} & 1 & 1 & 2 & 0 & 0 & 0 & -8 \\
 n_{\text{M},2} & 1 & 1 & 2 & 0 & 0 & 0 & -8 \\
 n_{\text{M},3} & 1 & 1 & 0 & 1 & 1 & 1 & -16 \\
 n_{\text{M},4} & 1 & 1 & 0 & 1 & 1 & 1 & -16 \\
 n_{\text{Z},1} & 1 & 2 & 1 & 1 & 0 & 1 & -16 \\
 n_{\text{Z},2} & 1 & 2 & 1 & 1 & 0 & 1 & -16 \\
 n_{\text{Z},3} & 1 & 0 & 1 & 0 & 1 & 0 & -8 \\
 n_{\text{Z},4} & 1 & 0 & 1 & 0 & 1 & 0 & -8 \\
 n_{\text{A},1} & 1 & 1 & 1 & 0 & 1 & 1 & -16 \\
 n_{\text{A},2} & 1 & 1 & 1 & 0 & 1 & 1 & -16 \\
 n_{\text{A},3} & 1 & 1 & 1 & 1 & 0 & 0 & -8 \\
 n_{\text{A},4} & 1 & 1 & 1 & 1 & 0 & 0 & -8 \\
 n_{\text{R},1} & 1 & 1 & 1 & 0 & 0 & 1 & -8 \\
 n_{\text{R},2} & 1 & 1 & 1 & 0 & 0 & 1 & -8 \\
 n_{\text{R},3} & 1 & 1 & 1 & 0 & 0 & 1 & -8 \\
 n_{\text{R},4} & 1 & 1 & 1 & 0 & 0 & 1 & -8 \\
 n_{\text{R},5} & 1 & 1 & 1 & 1 & 1 & 0 & -16 \\
 n_{\text{R},6} & 1 & 1 & 1 & 1 & 1 & 0 & -16 \\
 n_{\text{R},7} & 1 & 1 & 1 & 1 & 1 & 0 & -16 \\
 n_{\text{R},8} & 1 & 1 & 1 & 1 & 1 & 0 & -16 \\
 n_{\text{X},1} & 2 & 2 & 2 & 1 & 1 & 1 & -24 \\
 n_{\text{X},2} & 2 & 2 & 2 & 1 & 1 & 1 & -24
 \end{pmatrix}
 \tag{129}$$

$$\begin{pmatrix}
 \text{SG129} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 8 & 0 & 0 & 4 & 0 & -16 \\
 n_{\Gamma,1} & 1 & 0 & 0 & 1 & 0 & -4 \\
 n_{\Gamma,2} & 1 & 0 & -2 & 0 & 2 & -4 \\
 n_{\Gamma,3} & 1 & 0 & 1 & 1 & -2 & 0 \\
 n_{\Gamma,4} & 1 & 0 & 1 & 0 & 0 & 0 \\
 n_{\text{M},1} & 2 & 0 & 0 & 1 & 0 & -4 \\
 n_{\text{Z},1} & 1 & 1 & 3 & 1 & -4 & 0 \\
 n_{\text{Z},2} & 1 & -1 & -1 & 0 & 2 & -4 \\
 n_{\text{Z},3} & 1 & -1 & -2 & 1 & 2 & -4 \\
 n_{\text{Z},4} & 1 & 1 & 0 & 0 & 0 & 0 \\
 n_{\text{A},1} & 2 & 0 & 0 & 1 & 0 & -4 \\
 n_{\text{R},1} & 2 & 0 & 0 & 1 & 0 & -4 \\
 n_{\text{R},2} & 2 & 0 & 0 & 1 & 0 & -4 \\
 n_{\text{X},1} & 2 & 0 & 0 & 1 & 0 & -4 \\
 n_{\text{X},2} & 2 & 0 & 0 & 1 & 0 & -4
 \end{pmatrix}
 \tag{130}$$

$$\begin{pmatrix} \text{SG130} & a_1 & a_2 & a_3 & a_4 \\ \nu & 8 & 8 & 8 & 0 \\ n_{\Gamma,1} & 1 & 2 & 2 & 0 \\ n_{\Gamma,2} & 1 & 0 & 0 & -4 \\ n_{\Gamma,3} & 1 & 0 & 2 & 0 \\ n_{\Gamma,4} & 1 & 2 & 0 & 4 \\ n_{\text{M},1} & 2 & 2 & 2 & 0 \\ n_{\text{Z},1} & 1 & 1 & 2 & 0 \\ n_{\text{Z},2} & 1 & 1 & 2 & 0 \\ n_{\text{Z},3} & 1 & 1 & 0 & 0 \\ n_{\text{Z},4} & 1 & 1 & 0 & 0 \\ n_{\text{A},1} & 1 & 1 & 1 & 0 \\ n_{\text{R},1} & 1 & 1 & 1 & 0 \\ n_{\text{R},2} & 1 & 1 & 1 & 0 \\ n_{\text{X},1} & 2 & 2 & 2 & 0 \\ n_{\text{X},2} & 2 & 2 & 2 & 0 \end{pmatrix} \quad (131)$$

$$\begin{pmatrix} \text{SG131} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 \\ \nu & 8 & 4 & 4 & 4 & -28 & 32 & -32 \\ n_{\Gamma,1} & 1 & 1 & 1 & 1 & -7 & 8 & -8 \\ n_{\Gamma,2} & 1 & 0 & 0 & 1 & -3 & 4 & -4 \\ n_{\Gamma,3} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{\Gamma,4} & 1 & 1 & 1 & 0 & -4 & 4 & -4 \\ n_{\text{M},1} & 1 & 0 & 1 & 0 & -3 & 4 & -4 \\ n_{\text{M},2} & 1 & 1 & 0 & 0 & -3 & 4 & -4 \\ n_{\text{M},3} & 1 & 1 & 0 & 1 & -4 & 4 & -4 \\ n_{\text{M},4} & 1 & 0 & 1 & 1 & -4 & 4 & -4 \\ n_{\text{Z},1} & 2 & 1 & 1 & 1 & -7 & 8 & -8 \\ n_{\text{A},1} & 2 & 1 & 1 & 1 & -7 & 8 & -8 \\ n_{\text{R},1} & 2 & 1 & 1 & 2 & -9 & 10 & -8 \\ n_{\text{R},2} & 2 & 1 & 1 & 0 & -5 & 6 & -8 \\ n_{\text{X},1} & 2 & 1 & 1 & 1 & -4 & 4 & -4 \\ n_{\text{X},2} & 2 & 1 & 1 & 1 & -10 & 12 & -12 \end{pmatrix} \quad (132)$$

$$\begin{pmatrix} \text{SG132} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\ \nu & 8 & -12 & 4 & 4 & 8 & -32 \\ n_{\Gamma,1} & 1 & -3 & 1 & 1 & 2 & -8 \\ n_{\Gamma,2} & 1 & -1 & 0 & 1 & 0 & -4 \\ n_{\Gamma,3} & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{\Gamma,4} & 1 & -2 & 1 & 0 & 2 & -4 \\ n_{\text{M},1} & 1 & -2 & 0 & 1 & 2 & -4 \\ n_{\text{M},2} & 1 & -2 & 1 & 1 & 0 & -4 \\ n_{\text{M},3} & 1 & -1 & 1 & 0 & 0 & -4 \\ n_{\text{M},4} & 1 & -1 & 0 & 0 & 2 & -4 \\ n_{\text{Z},1} & 2 & -3 & 1 & 1 & 2 & -8 \\ n_{\text{A},1} & 2 & -3 & 1 & 1 & 2 & -8 \\ n_{\text{R},1} & 2 & -3 & 1 & 1 & 2 & -8 \\ n_{\text{R},2} & 2 & -3 & 1 & 1 & 2 & -8 \\ n_{\text{X},1} & 2 & 0 & 1 & 0 & 0 & -4 \\ n_{\text{X},2} & 2 & -6 & 1 & 2 & 4 & -12 \end{pmatrix} \quad (133)$$

$$\begin{pmatrix} \text{SG133} & a_1 & a_2 & a_3 \\ \nu & 8 & 8 & 0 \\ n_{\Gamma,1} & 1 & 2 & 0 \\ n_{\Gamma,2} & 1 & 0 & -4 \\ n_{\Gamma,3} & 1 & 0 & 0 \\ n_{\Gamma,4} & 1 & 2 & 4 \\ n_{M,1} & 2 & 2 & 0 \\ n_{Z,1} & 2 & 2 & 0 \\ n_{A,1} & 1 & 1 & 0 \\ n_{A,2} & 1 & 1 & 0 \\ n_{A,3} & 1 & 1 & 0 \\ n_{A,4} & 1 & 1 & 0 \\ n_{R,1} & 2 & 2 & 0 \\ n_{R,2} & 2 & 2 & 0 \\ n_{X,1} & 2 & 2 & 0 \\ n_{X,2} & 2 & 2 & 0 \end{pmatrix} \tag{134}$$

$$\begin{pmatrix} \text{SG134} & a_1 & a_2 & a_3 & a_4 & a_5 \\ \nu & 8 & 0 & -4 & 8 & -16 \\ n_{\Gamma,1} & 1 & 0 & -1 & 2 & -4 \\ n_{\Gamma,2} & 1 & 0 & -2 & 2 & -4 \\ n_{\Gamma,3} & 1 & 0 & 0 & 0 & 0 \\ n_{\Gamma,4} & 1 & 0 & 1 & 0 & 0 \\ n_{M,1} & 2 & 0 & -1 & 2 & -4 \\ n_{Z,1} & 2 & 0 & -1 & 2 & -4 \\ n_{A,1} & 1 & -1 & -1 & 2 & -4 \\ n_{A,2} & 1 & 1 & 2 & -2 & 0 \\ n_{A,3} & 1 & 1 & 0 & 0 & 0 \\ n_{A,4} & 1 & -1 & -3 & 4 & -4 \\ n_{R,1} & 2 & 0 & -1 & 2 & -4 \\ n_{R,2} & 2 & 0 & -1 & 2 & -4 \\ n_{X,1} & 2 & 0 & -1 & 2 & -4 \\ n_{X,2} & 2 & 0 & -1 & 2 & -4 \end{pmatrix} \tag{135}$$

$$\begin{pmatrix} \text{SG135} & a_1 & a_2 & a_3 & a_4 \\ \nu & 8 & 8 & 8 & -32 \\ n_{\Gamma,1} & 1 & 2 & 2 & -8 \\ n_{\Gamma,2} & 1 & 2 & 0 & -4 \\ n_{\Gamma,3} & 1 & 0 & 0 & 0 \\ n_{\Gamma,4} & 1 & 0 & 2 & -4 \\ n_{M,1} & 1 & 2 & 1 & -8 \\ n_{M,2} & 1 & 2 & 1 & -8 \\ n_{M,3} & 1 & 0 & 1 & 0 \\ n_{M,4} & 1 & 0 & 1 & 0 \\ n_{Z,1} & 2 & 2 & 2 & -8 \\ n_{A,1} & 1 & 1 & 1 & -4 \\ n_{R,1} & 2 & 2 & 2 & -8 \\ n_{R,2} & 2 & 2 & 2 & -8 \\ n_{X,1} & 2 & 2 & 2 & -8 \\ n_{X,2} & 2 & 2 & 2 & -8 \end{pmatrix} \tag{136}$$

$$\begin{pmatrix}
 \text{SG136} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 8 & 8 & 8 & 4 & -48 \\
 n_{\Gamma,1} & 1 & 2 & 2 & 1 & -12 \\
 n_{\Gamma,2} & 1 & 0 & 2 & 1 & -8 \\
 n_{\Gamma,3} & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,4} & 1 & 2 & 0 & 0 & -4 \\
 n_{\text{M},1} & 1 & 1 & 0 & 1 & -4 \\
 n_{\text{M},2} & 1 & 1 & 0 & 1 & -4 \\
 n_{\text{M},3} & 1 & 1 & 2 & 0 & -8 \\
 n_{\text{M},4} & 1 & 1 & 2 & 0 & -8 \\
 n_{\text{Z},1} & 2 & 2 & 2 & 1 & -12 \\
 n_{\text{A},1} & 2 & 2 & 2 & 1 & -12 \\
 n_{\text{R},1} & 1 & 1 & 1 & 0 & -4 \\
 n_{\text{R},2} & 1 & 1 & 1 & 0 & -4 \\
 n_{\text{R},3} & 1 & 1 & 1 & 0 & -4 \\
 n_{\text{R},4} & 1 & 1 & 1 & 0 & -4 \\
 n_{\text{R},5} & 1 & 1 & 1 & 1 & -8 \\
 n_{\text{R},6} & 1 & 1 & 1 & 1 & -8 \\
 n_{\text{R},7} & 1 & 1 & 1 & 1 & -8 \\
 n_{\text{R},8} & 1 & 1 & 1 & 1 & -8 \\
 n_{\text{X},1} & 2 & 2 & 2 & 1 & -12 \\
 n_{\text{X},2} & 2 & 2 & 2 & 1 & -12
 \end{pmatrix}
 \tag{137}$$

$$\begin{pmatrix}
 \text{SG137} & a_1 & a_2 & a_3 & a_4 \\
 \nu & 8 & 0 & 4 & -16 \\
 n_{\Gamma,1} & 1 & 0 & 1 & -4 \\
 n_{\Gamma,2} & 1 & 0 & 0 & -4 \\
 n_{\Gamma,3} & 1 & 0 & 0 & 0 \\
 n_{\Gamma,4} & 1 & 0 & 1 & 0 \\
 n_{\text{M},1} & 2 & 0 & 1 & -4 \\
 n_{\text{Z},1} & 2 & 0 & 1 & -4 \\
 n_{\text{A},1} & 1 & 1 & 0 & 0 \\
 n_{\text{A},2} & 1 & 1 & 0 & 0 \\
 n_{\text{A},3} & 1 & -1 & 1 & -4 \\
 n_{\text{A},4} & 1 & -1 & 1 & -4 \\
 n_{\text{R},1} & 2 & 0 & 1 & -4 \\
 n_{\text{R},2} & 2 & 0 & 1 & -4 \\
 n_{\text{X},1} & 2 & 0 & 1 & -4 \\
 n_{\text{X},2} & 2 & 0 & 1 & -4
 \end{pmatrix}
 \tag{138}$$

$$\begin{pmatrix} \text{SG138} & a_1 & a_2 & a_3 & a_4 \\ \nu & 8 & 8 & 0 & 0 \\ n_{\Gamma,1} & 1 & 2 & 0 & 0 \\ n_{\Gamma,2} & 1 & 2 & -2 & -4 \\ n_{\Gamma,3} & 1 & 0 & 0 & 0 \\ n_{\Gamma,4} & 1 & 0 & 2 & 4 \\ n_{M,1} & 2 & 2 & 0 & 0 \\ n_{Z,1} & 2 & 2 & 0 & 0 \\ n_{A,1} & 1 & 2 & -1 & 0 \\ n_{A,2} & 1 & 2 & -1 & 0 \\ n_{A,3} & 1 & 0 & 1 & 0 \\ n_{A,4} & 1 & 0 & 1 & 0 \\ n_{R,1} & 1 & 1 & 0 & 0 \\ n_{R,2} & 1 & 1 & 0 & 0 \\ n_{X,1} & 2 & 2 & 0 & 0 \\ n_{X,2} & 2 & 2 & 0 & 0 \end{pmatrix} \quad (139)$$

$$\begin{pmatrix} \text{SG139} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 \\ \nu & 8 & -86 & 4 & 4 & 4 & 2 & 2 & 72 & -112 \\ n_{\Gamma,1} & 1 & -17 & 1 & 1 & 1 & 1 & 0 & 14 & -24 \\ n_{\Gamma,2} & 1 & -12 & 0 & 0 & 1 & 0 & 1 & 10 & -16 \\ n_{\Gamma,3} & 1 & -7 & 1 & 0 & 0 & 0 & 0 & 6 & -8 \\ n_{\Gamma,4} & 1 & -7 & 0 & 1 & 0 & 0 & 0 & 6 & -8 \\ n_{N,1} & 2 & -18 & 1 & 1 & 1 & 0 & 0 & 16 & -24 \\ n_{N,2} & 2 & -18 & 1 & 1 & 1 & 0 & 0 & 16 & -24 \\ n_{N,3} & 2 & -25 & 1 & 1 & 1 & 1 & 1 & 20 & -32 \\ n_{N,4} & 2 & -25 & 1 & 1 & 1 & 1 & 1 & 20 & -32 \\ n_{X,1} & 2 & -25 & 1 & 1 & 0 & 1 & 1 & 22 & -32 \\ n_{X,2} & 2 & -18 & 1 & 1 & 2 & 0 & 0 & 14 & -24 \\ n_{Z,1} & 1 & -12 & 1 & 0 & 1 & 1 & 0 & 10 & -16 \\ n_{Z,2} & 1 & -13 & 0 & 1 & 1 & 0 & 1 & 10 & -16 \\ n_{Z,3} & 1 & -12 & 1 & 1 & 0 & 0 & 0 & 10 & -16 \\ n_{Z,4} & 1 & -6 & 0 & 0 & 0 & 0 & 0 & 6 & -8 \\ n_{P,1} & 2 & -18 & 1 & 1 & 1 & 1 & 0 & 14 & -24 \\ n_{P,2} & 2 & -25 & 1 & 1 & 1 & 0 & 1 & 22 & -32 \end{pmatrix} \quad (140)$$

$$\begin{pmatrix} \text{SG140} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 \\ \nu & 8 & 4 & -8 & 4 & 4 & -24 & -32 \\ n_{\Gamma,1} & 1 & 1 & -1 & 1 & 2 & -4 & 0 \\ n_{\Gamma,2} & 1 & 0 & -1 & 1 & 0 & -4 & -8 \\ n_{\Gamma,3} & 1 & 1 & -2 & 0 & 0 & -4 & -8 \\ n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{N,1} & 2 & 1 & -2 & 1 & 1 & -6 & -8 \\ n_{X,1} & 2 & 1 & -2 & 2 & 0 & -6 & -8 \\ n_{X,2} & 2 & 1 & -2 & 0 & 2 & -6 & -8 \\ n_{Z,1} & 1 & 0 & 0 & 1 & 0 & 0 & 0 \\ n_{Z,2} & 1 & 1 & -2 & 1 & 2 & -4 & 0 \\ n_{Z,3} & 1 & 0 & -1 & 0 & 0 & -4 & -8 \\ n_{Z,4} & 1 & 1 & -1 & 0 & 0 & -4 & -8 \\ n_{P,1} & 2 & 1 & -2 & 1 & 1 & -6 & -8 \\ n_{P,2} & 2 & 1 & -2 & 1 & 1 & -6 & -8 \end{pmatrix} \quad (141)$$

$$\begin{pmatrix} \text{SG141} & a_1 & a_2 & a_3 & a_4 & a_5 \\ \nu & 8 & 8 & -8 & 4 & -16 \\ n_{\Gamma,1} & 1 & 2 & -2 & 1 & -4 \\ n_{\Gamma,2} & 1 & 2 & -2 & 0 & -4 \\ n_{\Gamma,3} & 1 & 0 & 0 & 0 & 0 \\ n_{\Gamma,4} & 1 & 0 & 0 & 1 & 0 \\ n_{\text{N},1} & 2 & 1 & -1 & 1 & -4 \\ n_{\text{N},2} & 2 & 1 & -1 & 1 & -4 \\ n_{\text{N},3} & 2 & 3 & -3 & 1 & -4 \\ n_{\text{N},4} & 2 & 3 & -3 & 1 & -4 \\ n_{\text{X},1} & 2 & 2 & -2 & 1 & -4 \\ n_{\text{X},2} & 2 & 2 & -2 & 1 & -4 \\ n_{\text{Z},1} & 2 & 2 & -2 & 1 & -4 \\ n_{\text{P},1} & 1 & 1 & 0 & 0 & 0 \\ n_{\text{P},2} & 1 & 1 & 0 & 0 & 0 \\ n_{\text{P},3} & 1 & 1 & -2 & 1 & -4 \\ n_{\text{P},4} & 1 & 1 & -2 & 1 & -4 \\ n_{\text{P},5} & 2 & 2 & -2 & 1 & -4 \end{pmatrix} \tag{142}$$

$$\begin{pmatrix} \text{SG142} & a_1 & a_2 & a_3 \\ \nu & 8 & 8 & 0 \\ n_{\Gamma,1} & 1 & 2 & 0 \\ n_{\Gamma,2} & 1 & 0 & -4 \\ n_{\Gamma,3} & 1 & 0 & 0 \\ n_{\Gamma,4} & 1 & 2 & 4 \\ n_{\text{N},1} & 2 & 2 & 0 \\ n_{\text{X},1} & 2 & 2 & 0 \\ n_{\text{X},2} & 2 & 2 & 0 \\ n_{\text{Z},1} & 2 & 2 & 0 \\ n_{\text{P},1} & 1 & 1 & 0 \\ n_{\text{P},2} & 1 & 1 & 0 \\ n_{\text{P},3} & 1 & 1 & 0 \\ n_{\text{P},4} & 1 & 1 & 0 \\ n_{\text{P},5} & 1 & 1 & 0 \end{pmatrix} \tag{143}$$

$$\begin{pmatrix} \text{SG143} & a_1 & a_2 & a_3 & a_4 \\ \nu & 6 & 2 & 2 & 2 \\ n_{\Gamma,1} & 2 & 1 & 1 & 1 \\ n_{\Gamma,2} & 1 & 0 & 0 & 0 \\ n_{\Gamma,3} & 2 & 1 & 1 & 1 \\ n_{\text{M},1} & 3 & 1 & 1 & 1 \\ n_{\text{A},1} & 2 & 1 & 1 & 1 \\ n_{\text{A},2} & 1 & 0 & 0 & 0 \\ n_{\text{A},3} & 2 & 1 & 1 & 1 \\ n_{\text{L},1} & 3 & 1 & 1 & 1 \\ n_{\text{K},1} & 2 & 0 & 1 & 1 \\ n_{\text{K},2} & 2 & 1 & 1 & 0 \\ n_{\text{K},3} & 2 & 1 & 0 & 1 \\ n_{\text{H},1} & 2 & 0 & 1 & 1 \\ n_{\text{H},2} & 2 & 1 & 1 & 0 \\ n_{\text{H},3} & 2 & 1 & 0 & 1 \end{pmatrix} \tag{144}$$

$$\begin{pmatrix} \text{SG144} & a_1 \\ \nu & 6 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 1 \\ n_{\Gamma,3} & 2 \\ n_{\text{M},1} & 3 \\ n_{\text{A},1} & 2 \\ n_{\text{A},2} & 1 \\ n_{\text{A},3} & 2 \\ n_{\text{L},1} & 3 \\ n_{\text{K},1} & 2 \\ n_{\text{K},2} & 2 \\ n_{\text{K},3} & 2 \\ n_{\text{H},1} & 2 \\ n_{\text{H},2} & 2 \\ n_{\text{H},3} & 2 \end{pmatrix} \tag{145}$$

$$\begin{pmatrix} \text{SG145} & a_1 \\ \nu & 6 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 1 \\ n_{\Gamma,3} & 2 \\ n_{\text{M},1} & 3 \\ n_{\text{A},1} & 2 \\ n_{\text{A},2} & 1 \\ n_{\text{A},3} & 2 \\ n_{\text{L},1} & 3 \\ n_{\text{K},1} & 2 \\ n_{\text{K},2} & 2 \\ n_{\text{K},3} & 2 \\ n_{\text{H},1} & 2 \\ n_{\text{H},2} & 2 \\ n_{\text{H},3} & 2 \end{pmatrix} \tag{146}$$

$$\begin{pmatrix} \text{SG146} & a_1 & a_2 \\ \nu & 6 & 2 \\ n_{\Gamma,1} & 2 & 1 \\ n_{\Gamma,2} & 1 & 0 \\ n_{\Gamma,3} & 2 & 1 \\ n_{\text{Z},1} & 2 & 1 \\ n_{\text{Z},2} & 1 & 0 \\ n_{\text{Z},3} & 2 & 1 \\ n_{\text{L},1} & 3 & 1 \\ n_{\text{F},1} & 3 & 1 \end{pmatrix} \tag{147}$$

$$\left(\begin{array}{c|cccccccc}
 \text{SG147} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 \\
 \nu & 12 & 6 & 6 & 4 & 4 & 2 & -10 & 12 & -8 \\
 n_{\Gamma,1} & 2 & 2 & 2 & 1 & 1 & 1 & -5 & 6 & -4 \\
 n_{\Gamma,2} & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 2 & 2 & 1 & 1 & 1 & -5 & 6 & -4 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 2 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 2 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 \\
 n_{M,1} & 3 & 1 & 1 & 1 & 1 & 1 & -3 & 4 & -4 \\
 n_{M,2} & 3 & 2 & 2 & 1 & 1 & 0 & -2 & 2 & 0 \\
 n_{A,1} & 2 & 0 & 2 & 1 & 1 & 0 & -3 & 4 & -4 \\
 n_{A,2} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,3} & 2 & 0 & 2 & 1 & 1 & 0 & -3 & 4 & -4 \\
 n_{A,4} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,5} & 2 & 2 & 0 & 1 & 1 & 1 & -2 & 2 & 0 \\
 n_{A,6} & 2 & 2 & 0 & 1 & 1 & 1 & -2 & 2 & 0 \\
 n_{L,1} & 3 & 2 & 1 & 1 & 1 & 0 & -1 & 2 & 0 \\
 n_{L,2} & 3 & 1 & 2 & 1 & 1 & 1 & -4 & 4 & -4 \\
 n_{K,1} & 4 & 2 & 2 & 1 & 2 & 1 & -5 & 6 & -4 \\
 n_{K,2} & 2 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{K,3} & 4 & 2 & 2 & 1 & 2 & 1 & -5 & 6 & -4 \\
 n_{H,1} & 4 & 2 & 2 & 1 & 2 & 1 & -5 & 6 & -4 \\
 n_{H,2} & 2 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{H,3} & 4 & 2 & 2 & 1 & 2 & 1 & -5 & 6 & -4
 \end{array} \right) \tag{148}$$

$$\left(\begin{array}{c|cccccccc}
 \text{SG148} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 \\
 \nu & 12 & 6 & 6 & 4 & 2 & -10 & 12 & -8 \\
 n_{\Gamma,1} & 2 & 2 & 2 & 1 & 1 & -5 & 6 & -4 \\
 n_{\Gamma,2} & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 2 & 2 & 1 & 1 & -5 & 6 & -4 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 2 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 2 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\
 n_{Z,1} & 2 & 2 & 0 & 1 & 0 & -3 & 4 & -4 \\
 n_{Z,2} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{Z,3} & 2 & 2 & 0 & 1 & 0 & -3 & 4 & -4 \\
 n_{Z,4} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{Z,5} & 2 & 0 & 2 & 1 & 1 & -2 & 2 & 0 \\
 n_{Z,6} & 2 & 0 & 2 & 1 & 1 & -2 & 2 & 0 \\
 n_{L,1} & 3 & 1 & 2 & 1 & 0 & -1 & 2 & 0 \\
 n_{L,2} & 3 & 2 & 1 & 1 & 1 & -4 & 4 & -4 \\
 n_{F,1} & 3 & 1 & 1 & 1 & 1 & -3 & 4 & -4 \\
 n_{F,2} & 3 & 2 & 2 & 1 & 0 & -2 & 2 & 0
 \end{array} \right) \tag{149}$$

$$\begin{pmatrix}
 \text{SG149} & a_1 & a_2 & a_3 & a_4 \\
 \nu & 6 & 2 & 2 & 2 \\
 n_{\Gamma,1} & 1 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 1 & 1 & 1 \\
 n_{M,1} & 3 & 1 & 1 & 1 \\
 n_{M,2} & 3 & 1 & 1 & 1 \\
 n_{A,1} & 1 & 0 & 0 & 0 \\
 n_{A,2} & 1 & 0 & 0 & 0 \\
 n_{A,3} & 2 & 1 & 1 & 1 \\
 n_{L,1} & 3 & 1 & 1 & 1 \\
 n_{L,2} & 3 & 1 & 1 & 1 \\
 n_{K,1} & 2 & 0 & 1 & 1 \\
 n_{K,2} & 2 & 1 & 1 & 0 \\
 n_{K,3} & 2 & 1 & 0 & 1 \\
 n_{H,1} & 2 & 0 & 1 & 1 \\
 n_{H,2} & 2 & 1 & 1 & 0 \\
 n_{H,3} & 2 & 1 & 0 & 1
 \end{pmatrix} \tag{150}$$

$$\begin{pmatrix}
 \text{SG150} & a_1 & a_2 & a_3 \\
 \nu & 6 & 4 & 2 \\
 n_{\Gamma,1} & 1 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 2 & 1 \\
 n_{M,1} & 3 & 2 & 1 \\
 n_{M,2} & 3 & 2 & 1 \\
 n_{A,1} & 1 & 0 & 0 \\
 n_{A,2} & 1 & 0 & 0 \\
 n_{A,3} & 2 & 2 & 1 \\
 n_{L,1} & 3 & 2 & 1 \\
 n_{L,2} & 3 & 2 & 1 \\
 n_{K,1} & 1 & 1 & 0 \\
 n_{K,2} & 1 & 1 & 0 \\
 n_{K,3} & 2 & 1 & 1 \\
 n_{H,1} & 1 & 1 & 0 \\
 n_{H,2} & 1 & 1 & 0 \\
 n_{H,3} & 2 & 1 & 1
 \end{pmatrix} \tag{151}$$

$$\begin{array}{c}
 \text{SG151} \\
 \nu \\
 n_{\Gamma,1} \\
 n_{\Gamma,2} \\
 n_{\Gamma,3} \\
 n_{M,1} \\
 n_{M,2} \\
 n_{A,1} \\
 n_{A,2} \\
 n_{A,3} \\
 n_{L,1} \\
 n_{L,2} \\
 n_{K,1} \\
 n_{K,2} \\
 n_{K,3} \\
 n_{H,1} \\
 n_{H,2} \\
 n_{H,3}
 \end{array}
 \begin{array}{c}
 a_1 \\
 6 \\
 1 \\
 1 \\
 2 \\
 3 \\
 3 \\
 1 \\
 1 \\
 2 \\
 3 \\
 3 \\
 2 \\
 2 \\
 2 \\
 2 \\
 2 \\
 2 \\
 2
 \end{array}
 \tag{152}$$

$$\begin{array}{c}
 \text{SG152} \\
 \nu \\
 n_{\Gamma,1} \\
 n_{\Gamma,2} \\
 n_{\Gamma,3} \\
 n_{M,1} \\
 n_{M,2} \\
 n_{A,1} \\
 n_{A,2} \\
 n_{A,3} \\
 n_{L,1} \\
 n_{L,2} \\
 n_{K,1} \\
 n_{K,2} \\
 n_{K,3} \\
 n_{H,1} \\
 n_{H,2} \\
 n_{H,3}
 \end{array}
 \begin{array}{c}
 a_1 \\
 6 \\
 1 \\
 1 \\
 2 \\
 3 \\
 3 \\
 1 \\
 1 \\
 2 \\
 3 \\
 3 \\
 1 \\
 1 \\
 2 \\
 1 \\
 1 \\
 2
 \end{array}
 \tag{153}$$

$$\begin{pmatrix} \text{SG153} & a_1 \\ \nu & 6 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\Gamma,3} & 2 \\ n_{M,1} & 3 \\ n_{M,2} & 3 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{A,3} & 2 \\ n_{L,1} & 3 \\ n_{L,2} & 3 \\ n_{K,1} & 2 \\ n_{K,2} & 2 \\ n_{K,3} & 2 \\ n_{H,1} & 2 \\ n_{H,2} & 2 \\ n_{H,3} & 2 \end{pmatrix} \tag{154}$$

$$\begin{pmatrix} \text{SG154} & a_1 \\ \nu & 6 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\Gamma,3} & 2 \\ n_{M,1} & 3 \\ n_{M,2} & 3 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{A,3} & 2 \\ n_{L,1} & 3 \\ n_{L,2} & 3 \\ n_{K,1} & 1 \\ n_{K,2} & 1 \\ n_{K,3} & 2 \\ n_{H,1} & 1 \\ n_{H,2} & 1 \\ n_{H,3} & 2 \end{pmatrix} \tag{155}$$

$$\begin{pmatrix} \text{SG155} & a_1 & a_2 \\ \nu & 6 & 2 \\ n_{\Gamma,1} & 1 & 0 \\ n_{\Gamma,2} & 1 & 0 \\ n_{\Gamma,3} & 2 & 1 \\ n_{Z,1} & 1 & 0 \\ n_{Z,2} & 1 & 0 \\ n_{Z,3} & 2 & 1 \\ n_{L,1} & 3 & 1 \\ n_{L,2} & 3 & 1 \\ n_{F,1} & 3 & 1 \\ n_{F,2} & 3 & 1 \end{pmatrix} \tag{156}$$

$$\begin{pmatrix}
 \text{SG156} & a_1 & a_2 & a_3 & a_4 \\
 \nu & 6 & -2 & -2 & -2 \\
 n_{\Gamma,1} & 1 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & -1 & -1 & -1 \\
 n_{M,1} & 3 & -1 & -1 & -1 \\
 n_{M,2} & 3 & -1 & -1 & -1 \\
 n_{A,1} & 1 & 0 & 0 & 0 \\
 n_{A,2} & 1 & 0 & 0 & 0 \\
 n_{A,3} & 2 & -1 & -1 & -1 \\
 n_{L,1} & 3 & -1 & -1 & -1 \\
 n_{L,2} & 3 & -1 & -1 & -1 \\
 n_{K,1} & 2 & 0 & -1 & -1 \\
 n_{K,2} & 2 & -1 & -1 & 0 \\
 n_{K,3} & 2 & -1 & 0 & -1 \\
 n_{H,1} & 2 & 0 & -1 & -1 \\
 n_{H,2} & 2 & -1 & -1 & 0 \\
 n_{H,3} & 2 & -1 & 0 & -1
 \end{pmatrix}
 \tag{157}$$

$$\begin{pmatrix}
 \text{SG157} & a_1 & a_2 & a_3 \\
 \nu & 6 & 4 & -2 \\
 n_{\Gamma,1} & 1 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 2 & -1 \\
 n_{M,1} & 3 & 2 & -1 \\
 n_{M,2} & 3 & 2 & -1 \\
 n_{A,1} & 1 & 0 & 0 \\
 n_{A,2} & 1 & 0 & 0 \\
 n_{A,3} & 2 & 2 & -1 \\
 n_{L,1} & 3 & 2 & -1 \\
 n_{L,2} & 3 & 2 & -1 \\
 n_{K,1} & 1 & 1 & 0 \\
 n_{K,2} & 1 & 1 & 0 \\
 n_{K,3} & 2 & 1 & -1 \\
 n_{H,1} & 1 & 1 & 0 \\
 n_{H,2} & 1 & 1 & 0 \\
 n_{H,3} & 2 & 1 & -1
 \end{pmatrix}
 \tag{158}$$

$$\begin{pmatrix} \text{SG158} & a_1 & a_2 & a_3 & a_4 \\ \nu & 12 & 4 & 4 & 4 \\ n_{\Gamma,1} & 2 & 0 & 0 & 0 \\ n_{\Gamma,2} & 2 & 0 & 0 & 0 \\ n_{\Gamma,3} & 4 & 2 & 2 & 2 \\ n_{M,1} & 6 & 2 & 2 & 2 \\ n_{M,2} & 6 & 2 & 2 & 2 \\ n_{A,1} & 1 & 0 & 0 & 0 \\ n_{A,2} & 1 & 0 & 0 & 0 \\ n_{A,3} & 2 & 1 & 1 & 1 \\ n_{L,1} & 3 & 1 & 1 & 1 \\ n_{L,2} & 3 & 1 & 1 & 1 \\ n_{K,1} & 4 & 0 & 2 & 2 \\ n_{K,2} & 4 & 2 & 2 & 0 \\ n_{K,3} & 4 & 2 & 0 & 2 \\ n_{H,1} & 2 & 0 & 1 & 1 \\ n_{H,2} & 2 & 1 & 1 & 0 \\ n_{H,3} & 2 & 1 & 0 & 1 \end{pmatrix} \tag{159}$$

$$\begin{pmatrix} \text{SG159} & a_1 & a_2 & a_3 \\ \nu & 12 & 4 & 4 \\ n_{\Gamma,1} & 2 & 0 & 0 \\ n_{\Gamma,2} & 2 & 0 & 0 \\ n_{\Gamma,3} & 4 & 2 & 2 \\ n_{M,1} & 6 & 2 & 2 \\ n_{M,2} & 6 & 2 & 2 \\ n_{A,1} & 1 & 0 & 0 \\ n_{A,2} & 1 & 0 & 0 \\ n_{A,3} & 2 & 1 & 1 \\ n_{L,1} & 3 & 1 & 1 \\ n_{L,2} & 3 & 1 & 1 \\ n_{K,1} & 2 & 1 & 0 \\ n_{K,2} & 2 & 1 & 0 \\ n_{K,3} & 4 & 1 & 2 \\ n_{H,1} & 2 & 1 & 0 \\ n_{H,2} & 2 & 1 & 0 \\ n_{H,3} & 4 & 1 & 2 \end{pmatrix} \tag{160}$$

$$\begin{pmatrix} \text{SG160} & a_1 & a_2 \\ \nu & 6 & -2 \\ n_{\Gamma,1} & 1 & 0 \\ n_{\Gamma,2} & 1 & 0 \\ n_{\Gamma,3} & 2 & -1 \\ n_{Z,1} & 1 & 0 \\ n_{Z,2} & 1 & 0 \\ n_{Z,3} & 2 & -1 \\ n_{L,1} & 3 & -1 \\ n_{L,2} & 3 & -1 \\ n_{F,1} & 3 & -1 \\ n_{F,2} & 3 & -1 \end{pmatrix} \tag{161}$$

$$\left(\begin{array}{ccc} \text{SG161} & a_1 & a_2 \\ \nu & 12 & 4 \\ n_{\Gamma,1} & 2 & 0 \\ n_{\Gamma,2} & 2 & 0 \\ n_{\Gamma,3} & 4 & 2 \\ n_{Z,1} & 1 & 0 \\ n_{Z,2} & 1 & 0 \\ n_{Z,3} & 2 & 1 \\ n_{L,1} & 3 & 1 \\ n_{L,2} & 3 & 1 \\ n_{F,1} & 6 & 2 \\ n_{F,2} & 6 & 2 \end{array} \right)$$

(162)

$$\left(\begin{array}{ccccccccc} \text{SG162} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 \\ \nu & 12 & 4 & 6 & 6 & -4 & 0 & 2 & -4 & 8 \\ n_{\Gamma,1} & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{\Gamma,2} & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{\Gamma,3} & 2 & 1 & 2 & 2 & -1 & 0 & 1 & -2 & 4 \\ n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{\Gamma,5} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{\Gamma,6} & 2 & 1 & 0 & 0 & -1 & 0 & 0 & 0 & 0 \\ n_{M,1} & 3 & 1 & 1 & 1 & -1 & 0 & 1 & 0 & 0 \\ n_{M,2} & 3 & 1 & 1 & 1 & -1 & 0 & 1 & 0 & 0 \\ n_{M,3} & 3 & 1 & 2 & 2 & -1 & 0 & 0 & -2 & 4 \\ n_{M,4} & 3 & 1 & 2 & 2 & -1 & 0 & 0 & -2 & 4 \\ n_{A,1} & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{A,2} & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{A,3} & 2 & 1 & 0 & 2 & -1 & 1 & 0 & -2 & 4 \\ n_{A,4} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{A,5} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{A,6} & 2 & 1 & 2 & 0 & -1 & -1 & 1 & 0 & 0 \\ n_{L,1} & 3 & 1 & 2 & 1 & -1 & 1 & 0 & 0 & 4 \\ n_{L,2} & 3 & 1 & 2 & 1 & -1 & 1 & 0 & 0 & 4 \\ n_{L,3} & 3 & 1 & 1 & 2 & -1 & -1 & 1 & -2 & 0 \\ n_{L,4} & 3 & 1 & 1 & 2 & -1 & -1 & 1 & -2 & 0 \\ n_{K,1} & 2 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{K,2} & 2 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{K,3} & 4 & 1 & 2 & 2 & -2 & 0 & 1 & -2 & 4 \\ n_{H,1} & 2 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{H,2} & 2 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{H,3} & 4 & 1 & 2 & 2 & -2 & 0 & 1 & -2 & 4 \end{array} \right)$$

(163)

$$\begin{pmatrix}
 \text{SG163} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 12 & 12 & 4 & 4 & 4 & -16 \\
 n_{\Gamma,1} & 1 & 2 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 2 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 4 & 1 & 1 & 2 & -8 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 2 & 0 & 1 & 1 & 0 & 0 \\
 n_{M,1} & 3 & 2 & 1 & 1 & 2 & -4 \\
 n_{M,2} & 3 & 2 & 1 & 1 & 2 & -4 \\
 n_{M,3} & 3 & 4 & 1 & 1 & 0 & -4 \\
 n_{M,4} & 3 & 4 & 1 & 1 & 0 & -4 \\
 n_{A,1} & 1 & 1 & 0 & 0 & 0 & 0 \\
 n_{A,2} & 2 & 2 & 1 & 1 & 1 & -4 \\
 n_{A,3} & 2 & 2 & 1 & 1 & 1 & -4 \\
 n_{L,1} & 3 & 3 & 1 & 1 & 1 & -4 \\
 n_{K,1} & 2 & 2 & 1 & 0 & 0 & 0 \\
 n_{K,2} & 2 & 2 & 1 & 0 & 0 & 0 \\
 n_{K,3} & 4 & 4 & 1 & 2 & 2 & -8 \\
 n_{H,1} & 2 & 2 & 1 & 0 & 0 & 0 \\
 n_{H,2} & 2 & 2 & 1 & 0 & 0 & 0 \\
 n_{H,3} & 4 & 4 & 1 & 2 & 2 & -8
 \end{pmatrix}$$

(164)

$$\begin{pmatrix}
 \text{SG164} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 \\
 \nu & 12 & 6 & 6 & -4 & -4 & 0 & 2 & -4 & 8 \\
 n_{\Gamma,1} & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 2 & 2 & -1 & -1 & 0 & 1 & -2 & 4 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 2 & 0 & 0 & -1 & -1 & 0 & 0 & 0 & 0 \\
 n_{M,1} & 3 & 1 & 1 & -1 & -1 & 0 & 1 & 0 & 0 \\
 n_{M,2} & 3 & 1 & 1 & -1 & -1 & 0 & 1 & 0 & 0 \\
 n_{M,3} & 3 & 2 & 2 & -1 & -1 & 0 & 0 & -2 & 4 \\
 n_{M,4} & 3 & 2 & 2 & -1 & -1 & 0 & 0 & -2 & 4 \\
 n_{A,1} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,2} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,3} & 2 & 0 & 2 & -1 & -1 & 1 & 0 & -2 & 4 \\
 n_{A,4} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,5} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,6} & 2 & 2 & 0 & -1 & -1 & -1 & 1 & 0 & 0 \\
 n_{L,1} & 3 & 2 & 1 & -1 & -1 & 1 & 0 & 0 & 4 \\
 n_{L,2} & 3 & 2 & 1 & -1 & -1 & 1 & 0 & 0 & 4 \\
 n_{L,3} & 3 & 1 & 2 & -1 & -1 & -1 & 1 & -2 & 0 \\
 n_{L,4} & 3 & 1 & 2 & -1 & -1 & -1 & 1 & -2 & 0 \\
 n_{K,1} & 2 & 1 & 1 & -1 & 0 & 0 & 0 & 0 & 0 \\
 n_{K,2} & 2 & 1 & 1 & -1 & 0 & 0 & 0 & 0 & 0 \\
 n_{K,3} & 4 & 2 & 2 & -1 & -2 & 0 & 1 & -2 & 4 \\
 n_{H,1} & 2 & 1 & 1 & -1 & 0 & 0 & 0 & 0 & 0 \\
 n_{H,2} & 2 & 1 & 1 & -1 & 0 & 0 & 0 & 0 & 0 \\
 n_{H,3} & 4 & 2 & 2 & -1 & -2 & 0 & 1 & -2 & 4
 \end{pmatrix}$$

(165)

$$\begin{pmatrix}
 \text{SG165} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 12 & 12 & 8 & 4 & 4 & -16 \\
 n_{\Gamma,1} & 1 & 2 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 2 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 4 & 2 & 1 & 2 & -8 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 2 & 0 & 2 & 1 & 0 & 0 \\
 n_{M,1} & 3 & 2 & 2 & 1 & 2 & -4 \\
 n_{M,2} & 3 & 2 & 2 & 1 & 2 & -4 \\
 n_{M,3} & 3 & 4 & 2 & 1 & 0 & -4 \\
 n_{M,4} & 3 & 4 & 2 & 1 & 0 & -4 \\
 n_{A,1} & 1 & 1 & 0 & 0 & 0 & 0 \\
 n_{A,2} & 2 & 2 & 2 & 1 & 1 & -4 \\
 n_{A,3} & 2 & 2 & 2 & 1 & 1 & -4 \\
 n_{L,1} & 3 & 3 & 2 & 1 & 1 & -4 \\
 n_{K,1} & 2 & 2 & 2 & 0 & 0 & 0 \\
 n_{K,2} & 2 & 2 & 2 & 0 & 0 & 0 \\
 n_{K,3} & 4 & 4 & 2 & 2 & 2 & -8 \\
 n_{H,1} & 1 & 1 & 1 & 0 & 0 & 0 \\
 n_{H,2} & 1 & 1 & 1 & 0 & 0 & 0 \\
 n_{H,3} & 2 & 2 & 1 & 1 & 1 & -4
 \end{pmatrix}$$

(166)

$$\begin{pmatrix}
 \text{SG166} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 \\
 \nu & 12 & 6 & 6 & -4 & 0 & 2 & -4 & 8 \\
 n_{\Gamma,1} & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 2 & 2 & -1 & 0 & 1 & -2 & 4 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 2 & 0 & 0 & -1 & 0 & 0 & 0 & 0 \\
 n_{Z,1} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{Z,2} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{Z,3} & 2 & 2 & 0 & -1 & 1 & 0 & -2 & 4 \\
 n_{Z,4} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{Z,5} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{Z,6} & 2 & 0 & 2 & -1 & -1 & 1 & 0 & 0 \\
 n_{L,1} & 3 & 1 & 2 & -1 & 1 & 0 & 0 & 4 \\
 n_{L,2} & 3 & 1 & 2 & -1 & 1 & 0 & 0 & 4 \\
 n_{L,3} & 3 & 2 & 1 & -1 & -1 & 1 & -2 & 0 \\
 n_{L,4} & 3 & 2 & 1 & -1 & -1 & 1 & -2 & 0 \\
 n_{F,1} & 3 & 1 & 1 & -1 & 0 & 1 & 0 & 0 \\
 n_{F,2} & 3 & 1 & 1 & -1 & 0 & 1 & 0 & 0 \\
 n_{F,3} & 3 & 2 & 2 & -1 & 0 & 0 & -2 & 4 \\
 n_{F,4} & 3 & 2 & 2 & -1 & 0 & 0 & -2 & 4
 \end{pmatrix}$$

(167)

$$\begin{pmatrix}
 \text{SG167} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 12 & 12 & 4 & 4 & -16 \\
 n_{\Gamma,1} & 1 & 2 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 1 & 2 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 4 & 1 & 2 & -8 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 2 & 0 & 1 & 0 & 0 \\
 n_{Z,1} & 1 & 1 & 0 & 0 & 0 \\
 n_{Z,2} & 2 & 2 & 1 & 1 & -4 \\
 n_{Z,3} & 2 & 2 & 1 & 1 & -4 \\
 n_{L,1} & 3 & 3 & 1 & 1 & -4 \\
 n_{F,1} & 3 & 2 & 1 & 2 & -4 \\
 n_{F,2} & 3 & 2 & 1 & 2 & -4 \\
 n_{F,3} & 3 & 4 & 1 & 0 & -4 \\
 n_{F,4} & 3 & 4 & 1 & 0 & -4
 \end{pmatrix} \tag{168}$$

$$\begin{pmatrix}
 \text{SG168} & a_1 & a_2 & a_3 & a_4 \\
 \nu & 6 & 4 & 2 & 2 \\
 n_{\Gamma,1} & 1 & 1 & 1 & 0 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 1 \\
 n_{\Gamma,3} & 1 & 1 & 0 & 0 \\
 n_{\Gamma,4} & 1 & 1 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 0 & 0 & 1 \\
 n_{\Gamma,6} & 1 & 1 & 1 & 0 \\
 n_{M,1} & 3 & 2 & 1 & 1 \\
 n_{M,2} & 3 & 2 & 1 & 1 \\
 n_{A,1} & 1 & 1 & 1 & 0 \\
 n_{A,2} & 1 & 0 & 0 & 1 \\
 n_{A,3} & 1 & 1 & 0 & 0 \\
 n_{A,4} & 1 & 1 & 0 & 0 \\
 n_{A,5} & 1 & 0 & 0 & 1 \\
 n_{A,6} & 1 & 1 & 1 & 0 \\
 n_{L,1} & 3 & 2 & 1 & 1 \\
 n_{L,2} & 3 & 2 & 1 & 1 \\
 n_{K,1} & 2 & 1 & 1 & 0 \\
 n_{K,2} & 2 & 2 & 0 & 2 \\
 n_{K,3} & 2 & 1 & 1 & 0 \\
 n_{H,1} & 2 & 1 & 1 & 0 \\
 n_{H,2} & 2 & 2 & 0 & 2 \\
 n_{H,3} & 2 & 1 & 1 & 0
 \end{pmatrix} \tag{169}$$

$$\begin{pmatrix} \text{SG169} & a_1 \\ \nu & 12 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\Gamma,3} & 2 \\ n_{\Gamma,4} & 2 \\ n_{\Gamma,5} & 2 \\ n_{\Gamma,6} & 2 \\ n_{M,1} & 6 \\ n_{M,2} & 6 \\ n_{A,1} & 1 \\ n_{A,2} & 2 \\ n_{A,3} & 2 \\ n_{A,4} & 1 \\ n_{A,5} & 2 \\ n_{A,6} & 2 \\ n_{L,1} & 3 \\ n_{L,2} & 3 \\ n_{K,1} & 4 \\ n_{K,2} & 4 \\ n_{K,3} & 4 \\ n_{H,1} & 4 \\ n_{H,2} & 2 \\ n_{H,3} & 4 \end{pmatrix} \tag{170}$$

$$\begin{pmatrix} \text{SG170} & a_1 \\ \nu & 12 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\Gamma,3} & 2 \\ n_{\Gamma,4} & 2 \\ n_{\Gamma,5} & 2 \\ n_{\Gamma,6} & 2 \\ n_{M,1} & 6 \\ n_{M,2} & 6 \\ n_{A,1} & 1 \\ n_{A,2} & 2 \\ n_{A,3} & 2 \\ n_{A,4} & 1 \\ n_{A,5} & 2 \\ n_{A,6} & 2 \\ n_{L,1} & 3 \\ n_{L,2} & 3 \\ n_{K,1} & 4 \\ n_{K,2} & 4 \\ n_{K,3} & 4 \\ n_{H,1} & 4 \\ n_{H,2} & 2 \\ n_{H,3} & 4 \end{pmatrix} \tag{171}$$

$$\begin{pmatrix} \text{SG171} & a_1 \\ \nu & 6 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\Gamma,3} & 1 \\ n_{\Gamma,4} & 1 \\ n_{\Gamma,5} & 1 \\ n_{\Gamma,6} & 1 \\ n_{M,1} & 3 \\ n_{M,2} & 3 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{A,3} & 1 \\ n_{A,4} & 1 \\ n_{A,5} & 1 \\ n_{A,6} & 1 \\ n_{L,1} & 3 \\ n_{L,2} & 3 \\ n_{K,1} & 2 \\ n_{K,2} & 2 \\ n_{K,3} & 2 \\ n_{H,1} & 2 \\ n_{H,2} & 2 \\ n_{H,3} & 2 \end{pmatrix} \tag{172}$$

$$\begin{pmatrix} \text{SG172} & a_1 \\ \nu & 6 \\ n_{\Gamma,1} & 1 \\ n_{\Gamma,2} & 1 \\ n_{\Gamma,3} & 1 \\ n_{\Gamma,4} & 1 \\ n_{\Gamma,5} & 1 \\ n_{\Gamma,6} & 1 \\ n_{M,1} & 3 \\ n_{M,2} & 3 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{A,3} & 1 \\ n_{A,4} & 1 \\ n_{A,5} & 1 \\ n_{A,6} & 1 \\ n_{L,1} & 3 \\ n_{L,2} & 3 \\ n_{K,1} & 2 \\ n_{K,2} & 2 \\ n_{K,3} & 2 \\ n_{H,1} & 2 \\ n_{H,2} & 2 \\ n_{H,3} & 2 \end{pmatrix} \tag{173}$$

$$\left(\begin{array}{c} \text{SG173} \\ \nu \\ n_{\Gamma,1} \\ n_{\Gamma,2} \\ n_{\Gamma,3} \\ n_{\Gamma,4} \\ n_{\Gamma,5} \\ n_{\Gamma,6} \\ n_{M,1} \\ n_{M,2} \\ n_{A,1} \\ n_{A,2} \\ n_{A,3} \\ n_{A,4} \\ n_{A,5} \\ n_{A,6} \\ n_{L,1} \\ n_{L,2} \\ n_{K,1} \\ n_{K,2} \\ n_{K,3} \\ n_{H,1} \\ n_{H,2} \\ n_{H,3} \end{array} \begin{array}{ccc} a_1 & a_2 & a_3 \\ 12 & 4 & 4 \\ 2 & 1 & 1 \\ 2 & 0 & 0 \\ 2 & 1 & 1 \\ 2 & 1 & 1 \\ 2 & 0 & 0 \\ 2 & 1 & 1 \\ 6 & 2 & 2 \\ 6 & 2 & 2 \\ 1 & 0 & 0 \\ 2 & 1 & 1 \\ 2 & 1 & 1 \\ 1 & 0 & 0 \\ 2 & 1 & 1 \\ 2 & 1 & 1 \\ 3 & 1 & 1 \\ 3 & 1 & 1 \\ 4 & 1 & 2 \\ 4 & 2 & 0 \\ 4 & 1 & 2 \\ 4 & 1 & 2 \\ 2 & 1 & 0 \\ 4 & 1 & 2 \end{array} \right)$$

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$$\left(\begin{array}{c} \text{SG174} \\ \nu \\ n_{\Gamma,1} \\ n_{\Gamma,2} \\ n_{\Gamma,3} \\ n_{\Gamma,4} \\ n_{\Gamma,5} \\ n_{\Gamma,6} \\ n_{M,1} \\ n_{M,2} \\ n_{A,1} \\ n_{A,2} \\ n_{A,3} \\ n_{A,4} \\ n_{A,5} \\ n_{A,6} \\ n_{L,1} \\ n_{L,2} \\ n_{K,1} \\ n_{K,2} \\ n_{K,3} \\ n_{K,4} \\ n_{K,5} \\ n_{K,6} \\ n_{H,1} \\ n_{H,2} \\ n_{H,3} \\ n_{H,4} \\ n_{H,5} \\ n_{H,6} \end{array} \begin{array}{cccccccccccc} a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 & a_{10} \\ 6 & 4 & 4 & 4 & 2 & 2 & 2 & 2 & -30 & -30 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & -9 & -9 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & -6 & -6 \\ 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & -6 & -6 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & -9 & -9 \\ 3 & 2 & 2 & 2 & 1 & 1 & 1 & 1 & -15 & -15 \\ 3 & 2 & 2 & 2 & 1 & 1 & 1 & 1 & -15 & -15 \\ 1 & 1 & 1 & 1 & 0 & 1 & 0 & 1 & -6 & -9 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 & 1 & 0 & 1 & 0 & -9 & -6 \\ 1 & 1 & 1 & 1 & 1 & 0 & 1 & 0 & -9 & -6 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 & 0 & 1 & 0 & 1 & -6 & -9 \\ 3 & 2 & 2 & 2 & 1 & 1 & 1 & 1 & -15 & -15 \\ 3 & 2 & 2 & 2 & 1 & 1 & 1 & 1 & -15 & -15 \\ 1 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & -3 & -3 \\ 1 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & -6 & -6 \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & -6 & -6 \\ 1 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & -6 & -6 \\ 1 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & -6 & -6 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & -3 & -3 \\ 1 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & -6 & -3 \\ 1 & 1 & 1 & 0 & 1 & 0 & 0 & 1 & -6 & -6 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & -3 & -6 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & -3 & -6 \\ 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & -6 & -6 \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 & 0 & -6 & -3 \end{array} \right)$$

(175)

SG175	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	a_{11}	a_{12}	a_{13}	a_{14}
ν	12	8	6	6	4	4	4	4	2	2	-236	2	228	-144
$n_{\Gamma,1}$	1	1	1	1	1	0	1	1	1	0	-47	1	42	-36
$n_{\Gamma,2}$	1	0	1	1	0	1	0	0	0	1	-23	0	24	-12
$n_{\Gamma,3}$	1	1	1	1	0	0	0	0	0	0	-18	0	18	-12
$n_{\Gamma,4}$	1	1	1	1	0	0	0	0	0	0	-18	0	18	-12
$n_{\Gamma,5}$	1	0	1	1	0	1	0	0	0	1	-23	0	24	-12
$n_{\Gamma,6}$	1	1	1	1	1	0	1	1	1	0	-47	1	42	-36
$n_{\Gamma,7}$	1	1	0	0	1	0	0	0	0	0	-6	0	6	0
$n_{\Gamma,8}$	1	0	0	0	0	1	0	0	0	0	-6	0	6	0
$n_{\Gamma,9}$	1	1	0	0	0	0	1	1	0	0	-18	0	18	-12
$n_{\Gamma,10}$	1	1	0	0	0	0	1	1	0	0	-18	0	18	-12
$n_{\Gamma,11}$	1	0	0	0	0	1	0	0	0	0	-6	0	6	0
$n_{\Gamma,12}$	1	1	0	0	1	0	0	0	0	0	-6	0	6	0
$n_{M,1}$	3	2	1	1	1	1	1	1	1	1	-58	1	54	-36
$n_{M,2}$	3	2	1	1	1	1	1	1	1	1	-58	1	54	-36
$n_{M,3}$	3	2	2	2	1	1	1	1	0	0	-60	0	60	-36
$n_{M,4}$	3	2	2	2	1	1	1	1	0	0	-60	0	60	-36
$n_{A,1}$	1	1	0	1	1	0	0	1	0	0	-29	1	24	-24
$n_{A,2}$	1	0	0	1	0	1	0	0	0	0	-17	0	18	-12
$n_{A,3}$	1	1	0	1	0	0	1	0	0	0	-18	0	18	-12
$n_{A,4}$	1	1	0	1	0	0	1	0	0	0	-18	0	18	-12
$n_{A,5}$	1	0	0	1	0	1	0	0	0	0	-17	0	18	-12
$n_{A,6}$	1	1	0	1	1	0	0	1	0	0	-29	1	24	-24
$n_{A,7}$	1	1	1	0	1	0	1	0	1	0	-24	0	24	-12
$n_{A,8}$	1	0	1	0	0	1	0	0	0	1	-12	0	12	0
$n_{A,9}$	1	1	1	0	0	0	0	1	0	0	-18	0	18	-12
$n_{A,10}$	1	1	1	0	0	0	0	1	0	0	-18	0	18	-12
$n_{A,11}$	1	0	1	0	0	1	0	0	0	1	-12	0	12	0
$n_{A,12}$	1	1	1	0	1	0	1	0	1	0	-24	0	24	-12
$n_{L,1}$	3	2	2	1	1	1	1	1	0	0	-58	1	54	-36
$n_{L,2}$	3	2	2	1	1	1	1	1	0	0	-58	1	54	-36
$n_{L,3}$	3	2	1	2	1	1	1	1	1	1	-60	0	60	-36
$n_{L,4}$	3	2	1	2	1	1	1	1	1	1	-60	0	60	-36
$n_{K,1}$	2	1	1	1	1	0	0	0	1	0	-35	1	30	-24
$n_{K,2}$	2	2	1	1	0	2	1	1	0	1	-47	0	48	-24
$n_{K,3}$	2	1	1	1	1	0	1	1	0	0	-36	0	36	-24
$n_{K,4}$	2	1	1	1	1	0	1	1	0	0	-36	0	36	-24
$n_{K,5}$	2	2	1	1	0	2	1	1	0	1	-47	0	48	-24
$n_{K,6}$	2	1	1	1	1	0	0	0	1	0	-35	1	30	-24
$n_{H,1}$	2	1	1	1	1	0	1	0	0	0	-35	1	30	-24
$n_{H,2}$	2	2	1	1	0	2	1	1	0	1	-47	0	48	-24
$n_{H,3}$	2	1	1	1	1	0	0	1	1	0	-36	0	36	-24
$n_{H,4}$	2	1	1	1	1	0	0	1	1	0	-36	0	36	-24
$n_{H,5}$	2	2	1	1	0	2	1	1	0	1	-47	0	48	-24
$n_{H,6}$	2	1	1	1	1	0	1	0	0	0	-35	1	30	-24

(176)

$$\left(\begin{array}{c|cccccccc}
 \text{SG176} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 \\
 \nu & 12 & 12 & 8 & 8 & 4 & 4 & 4 & -52 & 432 \\
 n_{\Gamma,1} & 1 & 2 & 1 & 1 & 1 & 1 & 1 & -10 & 84 \\
 n_{\Gamma,2} & 1 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 1 & 2 & 1 & 1 & 0 & 0 & 1 & -7 & 60 \\
 n_{\Gamma,4} & 1 & 2 & 1 & 1 & 0 & 0 & 1 & -7 & 60 \\
 n_{\Gamma,5} & 1 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 1 & 2 & 1 & 1 & 1 & 1 & 1 & -10 & 84 \\
 n_{\Gamma,7} & 1 & 0 & 1 & 1 & 0 & 0 & 0 & -3 & 24 \\
 n_{\Gamma,8} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,9} & 1 & 0 & 1 & 1 & 1 & 1 & 0 & -6 & 48 \\
 n_{\Gamma,10} & 1 & 0 & 1 & 1 & 1 & 1 & 0 & -6 & 48 \\
 n_{\Gamma,11} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,12} & 1 & 0 & 1 & 1 & 0 & 0 & 0 & -3 & 24 \\
 n_{M,1} & 3 & 2 & 2 & 2 & 1 & 1 & 2 & -13 & 108 \\
 n_{M,2} & 3 & 2 & 2 & 2 & 1 & 1 & 2 & -13 & 108 \\
 n_{M,3} & 3 & 4 & 2 & 2 & 1 & 1 & 0 & -13 & 108 \\
 n_{M,4} & 3 & 4 & 2 & 2 & 1 & 1 & 0 & -13 & 108 \\
 n_{A,1} & 2 & 2 & 2 & 2 & 1 & 1 & 1 & -13 & 108 \\
 n_{A,2} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,3} & 2 & 2 & 2 & 2 & 1 & 1 & 1 & -13 & 108 \\
 n_{L,1} & 3 & 3 & 2 & 2 & 1 & 1 & 1 & -13 & 108 \\
 n_{K,1} & 2 & 2 & 1 & 2 & 0 & 0 & 1 & -7 & 60 \\
 n_{K,2} & 2 & 2 & 2 & 0 & 1 & 1 & 0 & -6 & 48 \\
 n_{K,3} & 2 & 2 & 1 & 2 & 1 & 1 & 1 & -13 & 108 \\
 n_{K,4} & 2 & 2 & 1 & 2 & 1 & 1 & 1 & -13 & 108 \\
 n_{K,5} & 2 & 2 & 2 & 0 & 1 & 1 & 0 & -6 & 48 \\
 n_{K,6} & 2 & 2 & 1 & 2 & 0 & 0 & 1 & -7 & 60 \\
 n_{H,1} & 2 & 2 & 1 & 2 & 0 & 1 & 1 & -10 & 84 \\
 n_{H,2} & 1 & 1 & 1 & 0 & 0 & 1 & 0 & -3 & 24 \\
 n_{H,3} & 2 & 2 & 1 & 2 & 0 & 1 & 1 & -10 & 84 \\
 n_{H,4} & 2 & 2 & 1 & 2 & 1 & 0 & 1 & -10 & 84 \\
 n_{H,5} & 1 & 1 & 1 & 0 & 1 & 0 & 0 & -3 & 24 \\
 n_{H,6} & 2 & 2 & 1 & 2 & 1 & 0 & 1 & -10 & 84
 \end{array} \right) \tag{177}$$

$$\left(\begin{array}{c|cccc}
 \text{SG177} & a_1 & a_2 & a_3 & a_4 \\
 \nu & 6 & 4 & 2 & 2 \\
 n_{\Gamma,1} & 1 & 0 & 0 & 1 \\
 n_{\Gamma,2} & 1 & 1 & 1 & 0 \\
 n_{\Gamma,3} & 1 & 1 & 0 & 0 \\
 n_{M,1} & 3 & 2 & 1 & 1 \\
 n_{A,1} & 1 & 0 & 0 & 1 \\
 n_{A,2} & 1 & 1 & 1 & 0 \\
 n_{A,3} & 1 & 1 & 0 & 0 \\
 n_{L,1} & 3 & 2 & 1 & 1 \\
 n_{K,1} & 1 & 1 & 0 & 1 \\
 n_{K,2} & 1 & 1 & 0 & 1 \\
 n_{K,3} & 2 & 1 & 1 & 0 \\
 n_{H,1} & 1 & 1 & 0 & 1 \\
 n_{H,2} & 1 & 1 & 0 & 1 \\
 n_{H,3} & 2 & 1 & 1 & 0
 \end{array} \right) \tag{178}$$

$$\begin{pmatrix} \text{SG178} & a_1 \\ \nu & 12 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\Gamma,3} & 2 \\ n_{M,1} & 6 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{A,3} & 1 \\ n_{A,4} & 1 \\ n_{A,5} & 1 \\ n_{A,6} & 2 \\ n_{L,1} & 3 \\ n_{L,2} & 3 \\ n_{L,3} & 3 \\ n_{L,4} & 3 \\ n_{K,1} & 2 \\ n_{K,2} & 2 \\ n_{K,3} & 4 \\ n_{H,1} & 2 \\ n_{H,2} & 2 \\ n_{H,3} & 4 \end{pmatrix} \tag{179}$$

$$\begin{pmatrix} \text{SG179} & a_1 \\ \nu & 12 \\ n_{\Gamma,1} & 2 \\ n_{\Gamma,2} & 2 \\ n_{\Gamma,3} & 2 \\ n_{M,1} & 6 \\ n_{A,1} & 1 \\ n_{A,2} & 1 \\ n_{A,3} & 1 \\ n_{A,4} & 1 \\ n_{A,5} & 1 \\ n_{A,6} & 2 \\ n_{L,1} & 3 \\ n_{L,2} & 3 \\ n_{L,3} & 3 \\ n_{L,4} & 3 \\ n_{K,1} & 2 \\ n_{K,2} & 2 \\ n_{K,3} & 4 \\ n_{H,1} & 2 \\ n_{H,2} & 2 \\ n_{H,3} & 4 \end{pmatrix} \tag{180}$$

$$\begin{array}{cc}
 \text{SG180} & a_1 \\
 \nu & 6 \\
 n_{\Gamma,1} & 1 \\
 n_{\Gamma,2} & 1 \\
 n_{\Gamma,3} & 1 \\
 n_{M,1} & 3 \\
 n_{A,1} & 1 \\
 n_{A,2} & 1 \\
 n_{A,3} & 1 \\
 n_{L,1} & 3 \\
 n_{K,1} & 1 \\
 n_{K,2} & 1 \\
 n_{K,3} & 2 \\
 n_{H,1} & 1 \\
 n_{H,2} & 1 \\
 n_{H,3} & 2
 \end{array}
 \tag{181}$$

$$\begin{array}{cc}
 \text{SG181} & a_1 \\
 \nu & 6 \\
 n_{\Gamma,1} & 1 \\
 n_{\Gamma,2} & 1 \\
 n_{\Gamma,3} & 1 \\
 n_{M,1} & 3 \\
 n_{A,1} & 1 \\
 n_{A,2} & 1 \\
 n_{A,3} & 1 \\
 n_{L,1} & 3 \\
 n_{K,1} & 1 \\
 n_{K,2} & 1 \\
 n_{K,3} & 2 \\
 n_{H,1} & 1 \\
 n_{H,2} & 1 \\
 n_{H,3} & 2
 \end{array}
 \tag{182}$$

$$\begin{pmatrix} \text{SG182} & a_1 & a_2 & a_3 \\ \nu & 12 & 4 & 4 \\ n_{\Gamma,1} & 2 & 0 & 0 \\ n_{\Gamma,2} & 2 & 1 & 1 \\ n_{\Gamma,3} & 2 & 1 & 1 \\ n_{M,1} & 6 & 2 & 2 \\ n_{A,1} & 1 & 0 & 0 \\ n_{A,2} & 1 & 0 & 0 \\ n_{A,3} & 1 & 0 & 0 \\ n_{A,4} & 1 & 0 & 0 \\ n_{A,5} & 2 & 1 & 1 \\ n_{A,6} & 2 & 1 & 1 \\ n_{L,1} & 3 & 1 & 1 \\ n_{L,2} & 3 & 1 & 1 \\ n_{L,3} & 3 & 1 & 1 \\ n_{L,4} & 3 & 1 & 1 \\ n_{K,1} & 2 & 1 & 0 \\ n_{K,2} & 2 & 1 & 0 \\ n_{K,3} & 4 & 1 & 2 \\ n_{H,1} & 2 & 1 & 0 \\ n_{H,2} & 2 & 1 & 0 \\ n_{H,3} & 4 & 1 & 2 \end{pmatrix} \tag{183}$$

$$\begin{pmatrix} \text{SG183} & a_1 & a_2 & a_3 & a_4 \\ \nu & 6 & 2 & 2 & 2 \\ n_{\Gamma,1} & 1 & 1 & 1 & 0 \\ n_{\Gamma,2} & 1 & 0 & 0 & 1 \\ n_{\Gamma,3} & 1 & 0 & 0 & 0 \\ n_{M,1} & 3 & 1 & 1 & 1 \\ n_{A,1} & 1 & 1 & 1 & 0 \\ n_{A,2} & 1 & 0 & 0 & 1 \\ n_{A,3} & 1 & 0 & 0 & 0 \\ n_{L,1} & 3 & 1 & 1 & 1 \\ n_{K,1} & 1 & 0 & 1 & 0 \\ n_{K,2} & 1 & 0 & 1 & 0 \\ n_{K,3} & 2 & 1 & 0 & 1 \\ n_{H,1} & 1 & 0 & 1 & 0 \\ n_{H,2} & 1 & 0 & 1 & 0 \\ n_{H,3} & 2 & 1 & 0 & 1 \end{pmatrix} \tag{184}$$

$$\begin{pmatrix}
 \text{SG184} & a_1 & a_2 & a_3 & a_4 \\
 \nu & 12 & 8 & 4 & 4 \\
 n_{\Gamma,1} & 2 & 0 & 0 & 2 \\
 n_{\Gamma,2} & 2 & 2 & 2 & 0 \\
 n_{\Gamma,3} & 2 & 2 & 0 & 0 \\
 n_{M,1} & 6 & 4 & 2 & 2 \\
 n_{A,1} & 1 & 1 & 1 & 0 \\
 n_{A,2} & 1 & 1 & 0 & 0 \\
 n_{A,3} & 1 & 0 & 0 & 1 \\
 n_{L,1} & 3 & 2 & 1 & 1 \\
 n_{K,1} & 2 & 2 & 0 & 2 \\
 n_{K,2} & 2 & 2 & 0 & 2 \\
 n_{K,3} & 4 & 2 & 2 & 0 \\
 n_{H,1} & 2 & 2 & 0 & 2 \\
 n_{H,2} & 2 & 2 & 0 & 2 \\
 n_{H,3} & 2 & 1 & 1 & 0
 \end{pmatrix} \tag{185}$$

$$\begin{pmatrix}
 \text{SG185} & a_1 & a_2 & a_3 \\
 \nu & 12 & 8 & -4 \\
 n_{\Gamma,1} & 2 & 0 & 0 \\
 n_{\Gamma,2} & 2 & 2 & -1 \\
 n_{\Gamma,3} & 2 & 2 & -1 \\
 n_{M,1} & 6 & 4 & -2 \\
 n_{A,1} & 1 & 0 & 0 \\
 n_{A,2} & 2 & 2 & -1 \\
 n_{A,3} & 2 & 2 & -1 \\
 n_{L,1} & 3 & 2 & -1 \\
 n_{K,1} & 2 & 2 & 0 \\
 n_{K,2} & 2 & 2 & 0 \\
 n_{K,3} & 4 & 2 & -2 \\
 n_{H,1} & 1 & 1 & 0 \\
 n_{H,2} & 1 & 1 & 0 \\
 n_{H,3} & 2 & 1 & -1
 \end{pmatrix} \tag{186}$$

$$\begin{pmatrix}
 \text{SG186} & a_1 & a_2 & a_3 \\
 \nu & 12 & -4 & -4 \\
 n_{\Gamma,1} & 2 & 0 & 0 \\
 n_{\Gamma,2} & 2 & -1 & -1 \\
 n_{\Gamma,3} & 2 & -1 & -1 \\
 n_{M,1} & 6 & -2 & -2 \\
 n_{A,1} & 1 & 0 & 0 \\
 n_{A,2} & 2 & -1 & -1 \\
 n_{A,3} & 2 & -1 & -1 \\
 n_{L,1} & 3 & -1 & -1 \\
 n_{K,1} & 2 & -1 & 0 \\
 n_{K,2} & 2 & -1 & 0 \\
 n_{K,3} & 4 & -1 & -2 \\
 n_{H,1} & 2 & -1 & 0 \\
 n_{H,2} & 2 & -1 & 0 \\
 n_{H,3} & 4 & -1 & -2
 \end{pmatrix} \tag{187}$$

$$\begin{pmatrix}
 \text{SG187} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 & a_{10} \\
 \nu & 6 & 2 & 2 & 2 & 2 & 2 & 2 & 2 & -12 & -12 \\
 n_{\Gamma,1} & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & -3 & -3 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & -3 & -3 \\
 n_{\Gamma,3} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{M,1} & 3 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & -6 & -6 \\
 n_{A,1} & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & -3 & -3 \\
 n_{A,2} & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & -3 \\
 n_{A,3} & 1 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & -3 & 0 \\
 n_{L,1} & 3 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & -6 & -6 \\
 n_{K,1} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{K,2} & 1 & 0 & 0 & 1 & 0 & 0 & 1 & 1 & -3 & -3 \\
 n_{K,3} & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 1 & -3 & -3 \\
 n_{K,4} & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & -3 & -3 \\
 n_{K,5} & 1 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & -3 & -3 \\
 n_{K,6} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{H,1} & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & -3 & 0 \\
 n_{H,2} & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & -3 & -3 \\
 n_{H,3} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & -3 \\
 n_{H,4} & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & -3 \\
 n_{H,5} & 1 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & -3 & -3 \\
 n_{H,6} & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 0 & -3 & 0
 \end{pmatrix}$$

(188)

$$\begin{pmatrix}
 \text{SG188} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 \\
 \nu & 12 & 4 & 4 & 4 & 4 & 4 & -24 \\
 n_{\Gamma,1} & 2 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 2 & 1 & 1 & 1 & 2 & 2 & -9 \\
 n_{\Gamma,3} & 2 & 1 & 1 & 1 & 0 & 0 & -3 \\
 n_{M,1} & 6 & 2 & 2 & 2 & 2 & 2 & -12 \\
 n_{A,1} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,2} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,3} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,5} & 2 & 1 & 1 & 1 & 1 & 1 & -6 \\
 n_{A,6} & 2 & 1 & 1 & 1 & 1 & 1 & -6 \\
 n_{L,1} & 3 & 1 & 1 & 1 & 1 & 1 & -6 \\
 n_{L,2} & 3 & 1 & 1 & 1 & 1 & 1 & -6 \\
 n_{L,3} & 3 & 1 & 1 & 1 & 1 & 1 & -6 \\
 n_{L,4} & 3 & 1 & 1 & 1 & 1 & 1 & -6 \\
 n_{K,1} & 2 & 1 & 0 & 1 & 0 & 0 & 0 \\
 n_{K,2} & 2 & 1 & 1 & 0 & 0 & 2 & -6 \\
 n_{K,3} & 2 & 0 & 1 & 1 & 0 & 2 & -6 \\
 n_{K,4} & 2 & 1 & 0 & 1 & 2 & 0 & -6 \\
 n_{K,5} & 2 & 1 & 1 & 0 & 2 & 0 & -6 \\
 n_{K,6} & 2 & 0 & 1 & 1 & 0 & 0 & 0 \\
 n_{H,1} & 2 & 1 & 0 & 1 & 1 & 0 & -3 \\
 n_{H,2} & 2 & 1 & 1 & 0 & 1 & 1 & -6 \\
 n_{H,3} & 2 & 0 & 1 & 1 & 0 & 1 & -3 \\
 n_{H,4} & 2 & 1 & 0 & 1 & 1 & 0 & -3 \\
 n_{H,5} & 2 & 1 & 1 & 0 & 1 & 1 & -6 \\
 n_{H,6} & 2 & 0 & 1 & 1 & 0 & 1 & -3
 \end{pmatrix}$$

(189)

$$\begin{pmatrix}
 \text{SG189} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 \\
 \nu & 6 & 8 & 2 & 4 & 4 & -36 & -36 \\
 n_{\Gamma,1} & 1 & 0 & 1 & 0 & 0 & -3 & -3 \\
 n_{\Gamma,2} & 1 & 2 & 0 & 2 & 2 & -9 & -9 \\
 n_{\Gamma,3} & 1 & 2 & 0 & 0 & 0 & -6 & -6 \\
 n_{M,1} & 3 & 4 & 1 & 2 & 2 & -18 & -18 \\
 n_{A,1} & 1 & 0 & 1 & 0 & 0 & -3 & -3 \\
 n_{A,2} & 1 & 2 & 0 & 0 & 2 & -6 & -9 \\
 n_{A,3} & 1 & 2 & 0 & 2 & 0 & -9 & -6 \\
 n_{L,1} & 3 & 4 & 1 & 2 & 2 & -18 & -18 \\
 n_{K,1} & 1 & 2 & 1 & 1 & 1 & -9 & -9 \\
 n_{K,2} & 1 & 1 & 0 & 0 & 0 & -3 & -3 \\
 n_{K,3} & 1 & 1 & 0 & 1 & 1 & -6 & -6 \\
 n_{H,1} & 1 & 2 & 1 & 1 & 1 & -9 & -9 \\
 n_{H,2} & 1 & 1 & 0 & 1 & 0 & -6 & -3 \\
 n_{H,3} & 1 & 1 & 0 & 0 & 1 & -3 & -6
 \end{pmatrix} \tag{190}$$

$$\begin{pmatrix}
 \text{SG190} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 12 & 8 & 4 & 4 & 4 & -24 \\
 n_{\Gamma,1} & 2 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,2} & 2 & 2 & 1 & 2 & 2 & -9 \\
 n_{\Gamma,3} & 2 & 2 & 1 & 0 & 0 & -3 \\
 n_{M,1} & 6 & 4 & 2 & 2 & 2 & -12 \\
 n_{A,1} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,2} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,3} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,4} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{A,5} & 2 & 2 & 1 & 1 & 1 & -6 \\
 n_{A,6} & 2 & 2 & 1 & 1 & 1 & -6 \\
 n_{L,1} & 3 & 2 & 1 & 1 & 1 & -6 \\
 n_{L,2} & 3 & 2 & 1 & 1 & 1 & -6 \\
 n_{L,3} & 3 & 2 & 1 & 1 & 1 & -6 \\
 n_{L,4} & 3 & 2 & 1 & 1 & 1 & -6 \\
 n_{K,1} & 2 & 2 & 0 & 1 & 1 & -6 \\
 n_{K,2} & 2 & 1 & 1 & 0 & 0 & 0 \\
 n_{K,3} & 2 & 1 & 1 & 1 & 1 & -6 \\
 n_{H,1} & 1 & 1 & 0 & 0 & 1 & -3 \\
 n_{H,2} & 1 & 1 & 0 & 0 & 1 & -3 \\
 n_{H,3} & 1 & 1 & 0 & 1 & 0 & -3 \\
 n_{H,4} & 1 & 1 & 0 & 1 & 0 & -3 \\
 n_{H,5} & 2 & 1 & 1 & 1 & 0 & -3 \\
 n_{H,6} & 2 & 1 & 1 & 0 & 1 & -3
 \end{pmatrix} \tag{191}$$

SG191	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	a_{11}	a_{12}	a_{13}	a_{14}
ν	12	4	6	6	4	4	4	4	2	2	-260	2	252	-144
$n_{\Gamma,1}$	1	1	1	1	1	0	0	0	1	0	-29	1	24	-12
$n_{\Gamma,2}$	1	0	1	1	0	1	1	1	0	1	-47	0	48	-36
$n_{\Gamma,3}$	1	0	1	1	0	0	0	0	0	0	-18	0	18	-12
$n_{\Gamma,4}$	1	1	0	0	1	0	0	0	0	0	-12	0	12	0
$n_{\Gamma,5}$	1	0	0	0	0	1	0	0	0	0	-6	0	6	0
$n_{\Gamma,6}$	1	0	0	0	0	0	1	1	0	0	-18	0	18	-12
$n_{M,1}$	3	1	1	1	1	1	1	1	1	1	-64	1	60	-36
$n_{M,2}$	3	1	2	2	1	1	1	1	0	0	-66	0	66	-36
$n_{A,1}$	1	1	0	1	1	0	0	0	0	0	-23	1	18	-12
$n_{A,2}$	1	0	0	1	0	1	0	1	0	0	-29	0	30	-24
$n_{A,3}$	1	0	0	1	0	0	1	0	0	0	-18	0	18	-12
$n_{A,4}$	1	1	1	0	1	0	0	0	1	0	-18	0	18	0
$n_{A,5}$	1	0	1	0	0	1	1	0	0	1	-24	0	24	-12
$n_{A,6}$	1	0	1	0	0	0	0	1	0	0	-18	0	18	-12
$n_{L,1}$	3	1	2	1	1	1	1	1	0	0	-64	1	60	-36
$n_{L,2}$	3	1	1	2	1	1	1	1	1	1	-66	0	66	-36
$n_{K,1}$	2	0	1	1	2	0	1	1	1	0	-47	1	42	-24
$n_{K,2}$	2	1	1	1	0	1	0	0	0	1	-41	0	42	-24
$n_{K,3}$	2	1	1	1	0	1	1	1	0	0	-42	0	42	-24
$n_{H,1}$	2	0	1	1	2	0	1	1	1	0	-47	1	42	-24
$n_{H,2}$	2	1	1	1	0	1	1	0	0	0	-41	0	42	-24
$n_{H,3}$	2	1	1	1	0	1	0	1	0	1	-42	0	42	-24

SG192	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9
ν	12	8	12	4	4	8	4	4	-336
$n_{\Gamma,1}$	1	0	2	0	1	0	0	2	-36
$n_{\Gamma,2}$	1	1	2	1	0	2	2	0	-60
$n_{\Gamma,3}$	1	1	2	0	0	0	0	0	-24
$n_{\Gamma,4}$	1	0	0	0	1	0	0	0	-12
$n_{\Gamma,5}$	1	1	0	1	0	0	0	0	-12
$n_{\Gamma,6}$	1	1	0	0	0	2	0	0	-24
$n_{M,1}$	3	2	2	1	1	2	2	2	-84
$n_{M,2}$	3	2	4	1	1	2	0	0	-84
$n_{A,1}$	1	0	1	0	1	0	0	1	-24
$n_{A,2}$	1	0	1	0	1	0	0	1	-24
$n_{A,3}$	1	1	1	0	0	1	0	0	-24
$n_{A,4}$	1	1	1	1	0	1	1	0	-36
$n_{A,5}$	1	1	1	0	0	1	0	0	-24
$n_{A,6}$	1	1	1	1	0	1	1	0	-36
$n_{L,1}$	3	2	3	1	1	2	1	1	-84
$n_{L,2}$	3	2	3	1	1	2	1	1	-84
$n_{K,1}$	2	2	2	0	2	2	0	2	-72
$n_{K,2}$	2	1	2	1	0	0	2	0	-48
$n_{K,3}$	2	1	2	1	0	2	0	0	-48
$n_{H,1}$	1	1	1	0	1	1	0	1	-36
$n_{H,2}$	1	1	1	0	1	1	0	1	-36
$n_{H,3}$	1	1	1	0	1	1	0	1	-36
$n_{H,4}$	1	1	1	0	1	1	0	1	-36
$n_{H,5}$	2	1	2	1	0	1	1	0	-48
$n_{H,6}$	2	1	2	1	0	1	1	0	-48

$$\begin{pmatrix}
 \text{SG193} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 \\
 \nu & 12 & 8 & 12 & 4 & 8 & 4 & -32 & 240 \\
 n_{\Gamma,1} & 1 & 0 & 2 & 1 & 0 & 0 & -3 & 24 \\
 n_{\Gamma,2} & 1 & 1 & 2 & 0 & 2 & 1 & -2 & 12 \\
 n_{\Gamma,3} & 1 & 1 & 2 & 0 & 0 & 1 & 1 & -12 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 1 & 0 & 0 & -3 & 24 \\
 n_{\Gamma,5} & 1 & 1 & 0 & 0 & 0 & 0 & -3 & 24 \\
 n_{\Gamma,6} & 1 & 1 & 0 & 0 & 2 & 0 & -6 & 48 \\
 n_{M,1} & 3 & 2 & 2 & 1 & 2 & 2 & -8 & 60 \\
 n_{M,2} & 3 & 2 & 4 & 1 & 2 & 0 & -8 & 60 \\
 n_{A,1} & 1 & 0 & 1 & 1 & 0 & 0 & -3 & 24 \\
 n_{A,2} & 1 & 0 & 1 & 1 & 0 & 0 & -3 & 24 \\
 n_{A,3} & 2 & 2 & 2 & 0 & 2 & 1 & -5 & 36 \\
 n_{L,1} & 3 & 2 & 3 & 1 & 2 & 1 & -8 & 60 \\
 n_{L,2} & 3 & 2 & 3 & 1 & 2 & 1 & -8 & 60 \\
 n_{K,1} & 2 & 2 & 2 & 2 & 2 & 0 & -12 & 96 \\
 n_{K,2} & 2 & 1 & 2 & 0 & 0 & 1 & 1 & -12 \\
 n_{K,3} & 2 & 1 & 2 & 0 & 2 & 1 & -5 & 36 \\
 n_{H,1} & 1 & 1 & 1 & 1 & 1 & 0 & -6 & 48 \\
 n_{H,2} & 2 & 1 & 2 & 0 & 1 & 1 & -2 & 12 \\
 n_{H,3} & 2 & 1 & 2 & 0 & 1 & 1 & -2 & 12
 \end{pmatrix}
 \tag{194}$$

$$\begin{pmatrix}
 \text{SG194} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 \\
 \nu & 12 & 12 & 4 & 4 & 4 & 4 & -4 & 4 & 0 \\
 n_{\Gamma,1} & 1 & 2 & 1 & 1 & 0 & 0 & -3 & 0 & 12 \\
 n_{\Gamma,2} & 1 & 2 & 0 & 0 & 1 & 1 & 2 & 1 & -12 \\
 n_{\Gamma,3} & 1 & 2 & 0 & 0 & 0 & 0 & 5 & 1 & -24 \\
 n_{\Gamma,4} & 1 & 0 & 1 & 1 & 0 & 0 & -3 & 0 & 12 \\
 n_{\Gamma,5} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 1 & 0 & 0 & 0 & 1 & 1 & -3 & 0 & 12 \\
 n_{M,1} & 3 & 2 & 1 & 1 & 1 & 1 & 0 & 2 & -12 \\
 n_{M,2} & 3 & 4 & 1 & 1 & 1 & 1 & -2 & 0 & 12 \\
 n_{A,1} & 1 & 1 & 1 & 1 & 0 & 0 & -3 & 0 & 12 \\
 n_{A,2} & 1 & 1 & 1 & 1 & 0 & 0 & -3 & 0 & 12 \\
 n_{A,3} & 2 & 2 & 0 & 0 & 1 & 1 & 2 & 1 & -12 \\
 n_{L,1} & 3 & 3 & 1 & 1 & 1 & 1 & -1 & 1 & 0 \\
 n_{L,2} & 3 & 3 & 1 & 1 & 1 & 1 & -1 & 1 & 0 \\
 n_{K,1} & 2 & 2 & 0 & 2 & 1 & 1 & -6 & 0 & 24 \\
 n_{K,2} & 2 & 2 & 1 & 0 & 0 & 0 & 5 & 1 & -24 \\
 n_{K,3} & 2 & 2 & 1 & 0 & 1 & 1 & -1 & 1 & 0 \\
 n_{H,1} & 1 & 1 & 0 & 1 & 0 & 1 & -3 & 0 & 12 \\
 n_{H,2} & 1 & 1 & 0 & 1 & 0 & 1 & -3 & 0 & 12 \\
 n_{H,3} & 1 & 1 & 0 & 1 & 1 & 0 & -3 & 0 & 12 \\
 n_{H,4} & 1 & 1 & 0 & 1 & 1 & 0 & -3 & 0 & 12 \\
 n_{H,5} & 2 & 2 & 1 & 0 & 1 & 0 & 2 & 1 & -12 \\
 n_{H,6} & 2 & 2 & 1 & 0 & 0 & 1 & 2 & 1 & -12
 \end{pmatrix}
 \tag{195}$$

$$\begin{pmatrix} \text{SG195} & a_1 & a_2 \\ \nu & 6 & 8 \\ n_{\Gamma,1} & 1 & 2 \\ n_{\Gamma,2} & 1 & 1 \\ n_{\Gamma,3} & 1 & 1 \\ n_{X,1} & 3 & 4 \\ n_{M,1} & 3 & 4 \\ n_{R,1} & 1 & 2 \\ n_{R,2} & 1 & 1 \\ n_{R,3} & 1 & 1 \end{pmatrix} \quad (196)$$

$$\begin{pmatrix} \text{SG196} & a_1 & a_2 \\ \nu & 6 & 8 \\ n_{\Gamma,1} & 1 & 2 \\ n_{\Gamma,2} & 1 & 1 \\ n_{\Gamma,3} & 1 & 1 \\ n_{X,1} & 3 & 4 \\ n_{L,1} & 2 & 3 \\ n_{L,2} & 1 & 1 \\ n_{L,3} & 2 & 3 \\ n_{W,1} & 3 & 4 \\ n_{W,2} & 3 & 4 \end{pmatrix} \quad (197)$$

$$\begin{pmatrix} \text{SG197} & a_1 & a_2 \\ \nu & 6 & 8 \\ n_{\Gamma,1} & 1 & 2 \\ n_{\Gamma,2} & 1 & 1 \\ n_{\Gamma,3} & 1 & 1 \\ n_{H,1} & 1 & 2 \\ n_{H,2} & 1 & 1 \\ n_{H,3} & 1 & 1 \\ n_{P,1} & 1 & 2 \\ n_{P,2} & 1 & 1 \\ n_{P,3} & 1 & 1 \\ n_{N,1} & 3 & 4 \\ n_{N,2} & 3 & 4 \end{pmatrix} \quad (198)$$

$$\begin{pmatrix} \text{SG198} & a_1 & a_2 \\ \nu & 24 & 8 \\ n_{\Gamma,1} & 4 & 2 \\ n_{\Gamma,2} & 4 & 1 \\ n_{\Gamma,3} & 4 & 1 \\ n_{X,1} & 6 & 2 \\ n_{X,2} & 6 & 2 \\ n_{X,3} & 6 & 2 \\ n_{X,4} & 6 & 2 \\ n_{M,1} & 6 & 2 \\ n_{R,1} & 1 & 0 \\ n_{R,2} & 2 & 1 \\ n_{R,3} & 2 & 1 \\ n_{R,4} & 3 & 1 \end{pmatrix} \quad (199)$$

$$\begin{pmatrix} \text{SG199} & a_1 & a_2 \\ \nu & 12 & 8 \\ n_{\Gamma,1} & 2 & 2 \\ n_{\Gamma,2} & 2 & 1 \\ n_{\Gamma,3} & 2 & 1 \\ n_{\text{H},1} & 2 & 2 \\ n_{\text{H},2} & 2 & 1 \\ n_{\text{H},3} & 2 & 1 \\ n_{\text{P},1} & 1 & 0 \\ n_{\text{P},2} & 1 & 1 \\ n_{\text{P},3} & 1 & 1 \\ n_{\text{P},4} & 3 & 2 \\ n_{\text{N},1} & 6 & 4 \\ n_{\text{N},2} & 6 & 4 \end{pmatrix}$$

(200)

$$\begin{pmatrix} \text{SG200} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 \\ \nu & 12 & 16 & 6 & 6 & 2 & -10 & 12 & -8 \\ n_{\Gamma,1} & 1 & 2 & 1 & 1 & 1 & -5 & 6 & -4 \\ n_{\Gamma,2} & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 \\ n_{\Gamma,3} & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 \\ n_{\Gamma,4} & 1 & 2 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{\Gamma,5} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{\Gamma,6} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ n_{\text{X},1} & 3 & 4 & 2 & 1 & 0 & -1 & 2 & 0 \\ n_{\text{X},2} & 3 & 4 & 1 & 2 & 1 & -4 & 4 & -4 \\ n_{\text{M},1} & 3 & 4 & 1 & 1 & 1 & -3 & 4 & -4 \\ n_{\text{M},2} & 3 & 4 & 2 & 2 & 0 & -2 & 2 & 0 \\ n_{\text{R},1} & 1 & 2 & 0 & 1 & 0 & -3 & 4 & -4 \\ n_{\text{R},2} & 1 & 1 & 0 & 1 & 0 & 0 & 0 & 0 \\ n_{\text{R},3} & 1 & 1 & 0 & 1 & 0 & 0 & 0 & 0 \\ n_{\text{R},4} & 1 & 2 & 1 & 0 & 1 & -2 & 2 & 0 \\ n_{\text{R},5} & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ n_{\text{R},6} & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

(201)

$$\begin{pmatrix} \text{SG201} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\ \nu & 12 & 16 & 8 & -16 & 24 & -32 \\ n_{\Gamma,1} & 1 & 2 & 2 & -6 & 8 & -8 \\ n_{\Gamma,2} & 1 & 1 & 1 & -1 & 2 & -4 \\ n_{\Gamma,3} & 1 & 1 & 1 & -1 & 2 & -4 \\ n_{\Gamma,4} & 1 & 2 & 0 & 0 & 0 & 0 \\ n_{\Gamma,5} & 1 & 1 & 0 & 0 & 0 & 0 \\ n_{\Gamma,6} & 1 & 1 & 0 & 0 & 0 & 0 \\ n_{\text{X},1} & 3 & 4 & 2 & -4 & 6 & -8 \\ n_{\text{X},2} & 3 & 4 & 2 & -4 & 6 & -8 \\ n_{\text{M},1} & 3 & 4 & 2 & -4 & 6 & -8 \\ n_{\text{M},2} & 3 & 4 & 2 & -4 & 6 & -8 \\ n_{\text{R},1} & 1 & 2 & 0 & -2 & 4 & -4 \\ n_{\text{R},2} & 1 & 1 & 0 & 1 & 0 & 0 \\ n_{\text{R},3} & 1 & 1 & 0 & 1 & 0 & 0 \\ n_{\text{R},4} & 1 & 2 & 2 & -4 & 4 & -4 \\ n_{\text{R},5} & 1 & 1 & 1 & -2 & 2 & -4 \\ n_{\text{R},6} & 1 & 1 & 1 & -2 & 2 & -4 \end{pmatrix}$$

(202)

$$\begin{pmatrix}
 \text{SG202} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 \\
 \nu & 12 & 16 & 12 & 2 & 4 & 2 & -32 \\
 n_{\Gamma,1} & 1 & 2 & 2 & 1 & 0 & 1 & -8 \\
 n_{\Gamma,2} & 1 & 1 & 2 & 0 & 1 & 0 & -4 \\
 n_{\Gamma,3} & 1 & 1 & 2 & 0 & 1 & 0 & -4 \\
 n_{\Gamma,4} & 1 & 2 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{X,1} & 3 & 4 & 2 & 1 & 2 & 1 & -12 \\
 n_{X,2} & 3 & 4 & 4 & 0 & 0 & 0 & -4 \\
 n_{L,1} & 1 & 1 & 1 & 0 & 1 & 0 & -4 \\
 n_{L,2} & 2 & 3 & 2 & 0 & 0 & 1 & -4 \\
 n_{L,3} & 2 & 3 & 2 & 1 & 1 & 0 & -8 \\
 n_{L,4} & 1 & 1 & 1 & 0 & 0 & 0 & 0 \\
 n_{L,5} & 2 & 3 & 2 & 1 & 1 & 0 & -8 \\
 n_{L,6} & 2 & 3 & 2 & 0 & 0 & 1 & -4 \\
 n_{W,1} & 6 & 8 & 6 & 1 & 2 & 1 & -16
 \end{pmatrix} \tag{203}$$

$$\begin{pmatrix}
 \text{SG203} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 12 & 16 & 8 & 8 & 8 & -48 \\
 n_{\Gamma,1} & 1 & 2 & 2 & 0 & 2 & -8 \\
 n_{\Gamma,2} & 1 & 1 & 1 & 2 & 1 & -8 \\
 n_{\Gamma,3} & 1 & 1 & 1 & 2 & 1 & -8 \\
 n_{\Gamma,4} & 1 & 2 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 1 & 1 & 0 & 0 & 0 & 0 \\
 n_{X,1} & 3 & 4 & 2 & 2 & 2 & -12 \\
 n_{X,2} & 3 & 4 & 2 & 2 & 2 & -12 \\
 n_{L,1} & 1 & 1 & 0 & 1 & 1 & -4 \\
 n_{L,2} & 2 & 3 & 2 & 2 & 1 & -12 \\
 n_{L,3} & 2 & 3 & 1 & 0 & 2 & -4 \\
 n_{L,4} & 1 & 1 & 1 & 1 & 0 & -4 \\
 n_{L,5} & 2 & 3 & 1 & 0 & 2 & -4 \\
 n_{L,6} & 2 & 3 & 2 & 2 & 1 & -12 \\
 n_{W,1} & 3 & 4 & 2 & 2 & 2 & -12 \\
 n_{W,2} & 3 & 4 & 2 & 2 & 2 & -12 \\
 n_{W,3} & 3 & 4 & 2 & 2 & 2 & -12 \\
 n_{W,4} & 3 & 4 & 2 & 2 & 2 & -12
 \end{pmatrix} \tag{204}$$

$$\begin{pmatrix}
 \text{SG204} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 \\
 \nu & 12 & 16 & 8 & -16 & 6 & 12 & -32 \\
 n_{\Gamma,1} & 1 & 2 & 2 & -6 & 1 & 6 & -8 \\
 n_{\Gamma,2} & 1 & 1 & 1 & -1 & 1 & 0 & -4 \\
 n_{\Gamma,3} & 1 & 1 & 1 & -1 & 1 & 0 & -4 \\
 n_{\Gamma,4} & 1 & 2 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\text{H},1} & 1 & 2 & 0 & -2 & 1 & 2 & -4 \\
 n_{\text{H},2} & 1 & 1 & 0 & 1 & 1 & -2 & 0 \\
 n_{\text{H},3} & 1 & 1 & 0 & 1 & 1 & -2 & 0 \\
 n_{\text{H},4} & 1 & 2 & 2 & -4 & 0 & 4 & -4 \\
 n_{\text{H},5} & 1 & 1 & 1 & -2 & 0 & 2 & -4 \\
 n_{\text{H},6} & 1 & 1 & 1 & -2 & 0 & 2 & -4 \\
 n_{\text{P},1} & 2 & 4 & 2 & -6 & 1 & 6 & -8 \\
 n_{\text{P},2} & 2 & 2 & 1 & -1 & 1 & 0 & -4 \\
 n_{\text{P},3} & 2 & 2 & 1 & -1 & 1 & 0 & -4 \\
 n_{\text{N},1} & 3 & 4 & 2 & -4 & 1 & 4 & -8 \\
 n_{\text{N},2} & 3 & 4 & 2 & -4 & 1 & 4 & -8 \\
 n_{\text{N},3} & 3 & 4 & 2 & -4 & 2 & 2 & -8 \\
 n_{\text{N},4} & 3 & 4 & 2 & -4 & 2 & 2 & -8
 \end{pmatrix}
 \tag{205}$$

$$\begin{pmatrix}
 \text{SG205} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 48 & 16 & 8 & 8 & 8 & -96 \\
 n_{\Gamma,1} & 4 & 2 & 2 & 0 & 2 & -12 \\
 n_{\Gamma,2} & 4 & 1 & 1 & 2 & 1 & -12 \\
 n_{\Gamma,3} & 4 & 1 & 1 & 2 & 1 & -12 \\
 n_{\Gamma,4} & 4 & 2 & 0 & 0 & 0 & -4 \\
 n_{\Gamma,5} & 4 & 1 & 0 & 0 & 0 & -4 \\
 n_{\Gamma,6} & 4 & 1 & 0 & 0 & 0 & -4 \\
 n_{\text{X},1} & 12 & 4 & 2 & 2 & 2 & -24 \\
 n_{\text{X},2} & 12 & 4 & 2 & 2 & 2 & -24 \\
 n_{\text{M},1} & 6 & 2 & 1 & 1 & 1 & -12 \\
 n_{\text{M},2} & 6 & 2 & 1 & 1 & 1 & -12 \\
 n_{\text{R},1} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\text{R},2} & 2 & 1 & 0 & 0 & 1 & -4 \\
 n_{\text{R},3} & 2 & 1 & 0 & 0 & 1 & -4 \\
 n_{\text{R},4} & 3 & 1 & 0 & 0 & 1 & -4 \\
 n_{\text{R},5} & 1 & 0 & 0 & 1 & 0 & -4 \\
 n_{\text{R},6} & 2 & 1 & 1 & 0 & 0 & -4 \\
 n_{\text{R},7} & 2 & 1 & 1 & 0 & 0 & -4 \\
 n_{\text{R},8} & 3 & 1 & 1 & 1 & 0 & -8
 \end{pmatrix}
 \tag{206}$$

$$\begin{pmatrix}
 \text{SG206} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 24 & 16 & 8 & -40 & 48 & -32 \\
 n_{\Gamma,1} & 2 & 2 & 2 & -8 & 10 & -8 \\
 n_{\Gamma,2} & 2 & 1 & 1 & -3 & 4 & -4 \\
 n_{\Gamma,3} & 2 & 1 & 1 & -3 & 4 & -4 \\
 n_{\Gamma,4} & 2 & 2 & 0 & -2 & 2 & 0 \\
 n_{\Gamma,5} & 2 & 1 & 0 & -2 & 2 & 0 \\
 n_{\Gamma,6} & 2 & 1 & 0 & -2 & 2 & 0 \\
 n_{\text{H},1} & 2 & 2 & 0 & -4 & 6 & -4 \\
 n_{\text{H},2} & 2 & 1 & 0 & -1 & 2 & 0 \\
 n_{\text{H},3} & 2 & 1 & 0 & -1 & 2 & 0 \\
 n_{\text{H},4} & 2 & 2 & 2 & -6 & 6 & -4 \\
 n_{\text{H},5} & 2 & 1 & 1 & -4 & 4 & -4 \\
 n_{\text{H},6} & 2 & 1 & 1 & -4 & 4 & -4 \\
 n_{\text{P},1} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\text{P},2} & 2 & 2 & 1 & -5 & 6 & -4 \\
 n_{\text{P},3} & 2 & 2 & 1 & -5 & 6 & -4 \\
 n_{\text{N},1} & 6 & 4 & 2 & -10 & 12 & -8
 \end{pmatrix} \tag{207}$$

$$\begin{pmatrix}
 \text{SG207} & a_1 & a_2 & a_3 & a_4 \\
 \nu & 12 & 8 & 6 & 6 \\
 n_{\Gamma,1} & 1 & 1 & 1 & 1 \\
 n_{\Gamma,2} & 1 & 1 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 1 & 1 & 1 \\
 n_{\text{X},1} & 3 & 2 & 2 & 2 \\
 n_{\text{X},2} & 3 & 2 & 1 & 1 \\
 n_{\text{M},1} & 3 & 2 & 1 & 2 \\
 n_{\text{M},2} & 3 & 2 & 2 & 1 \\
 n_{\text{R},1} & 1 & 1 & 0 & 1 \\
 n_{\text{R},2} & 1 & 1 & 1 & 0 \\
 n_{\text{R},3} & 2 & 1 & 1 & 1
 \end{pmatrix} \tag{208}$$

$$\begin{pmatrix}
 \text{SG208} & a_1 & a_2 \\
 \nu & 12 & 8 \\
 n_{\Gamma,1} & 1 & 1 \\
 n_{\Gamma,2} & 1 & 1 \\
 n_{\Gamma,3} & 2 & 1 \\
 n_{\text{X},1} & 3 & 2 \\
 n_{\text{X},2} & 3 & 2 \\
 n_{\text{M},1} & 3 & 2 \\
 n_{\text{M},2} & 3 & 2 \\
 n_{\text{R},1} & 1 & 1 \\
 n_{\text{R},2} & 1 & 1 \\
 n_{\text{R},3} & 2 & 1
 \end{pmatrix} \tag{209}$$

$$\begin{pmatrix} \text{SG209} & a_1 & a_2 & a_3 \\ \nu & 12 & 8 & 6 \\ n_{\Gamma,1} & 1 & 1 & 1 \\ n_{\Gamma,2} & 1 & 1 & 0 \\ n_{\Gamma,3} & 2 & 1 & 1 \\ n_{X,1} & 3 & 2 & 2 \\ n_{X,2} & 3 & 2 & 1 \\ n_{L,1} & 2 & 1 & 1 \\ n_{L,2} & 2 & 1 & 1 \\ n_{L,3} & 4 & 3 & 2 \\ n_{W,1} & 6 & 4 & 3 \end{pmatrix} \tag{210}$$

$$\begin{pmatrix} \text{SG210} & a_1 & a_2 \\ \nu & 12 & 8 \\ n_{\Gamma,1} & 1 & 1 \\ n_{\Gamma,2} & 1 & 1 \\ n_{\Gamma,3} & 2 & 1 \\ n_{X,1} & 3 & 2 \\ n_{X,2} & 3 & 2 \\ n_{L,1} & 2 & 1 \\ n_{L,2} & 2 & 1 \\ n_{L,3} & 4 & 3 \\ n_{W,1} & 3 & 2 \\ n_{W,2} & 3 & 2 \\ n_{W,3} & 3 & 2 \\ n_{W,4} & 3 & 2 \end{pmatrix} \tag{211}$$

$$\begin{pmatrix} \text{SG211} & a_1 & a_2 & a_3 \\ \nu & 12 & 8 & 6 \\ n_{\Gamma,1} & 1 & 1 & 1 \\ n_{\Gamma,2} & 1 & 1 & 0 \\ n_{\Gamma,3} & 2 & 1 & 1 \\ n_{H,1} & 1 & 1 & 1 \\ n_{H,2} & 1 & 1 & 0 \\ n_{H,3} & 2 & 1 & 1 \\ n_{P,1} & 2 & 2 & 1 \\ n_{P,2} & 2 & 1 & 1 \\ n_{P,3} & 2 & 1 & 1 \\ n_{N,1} & 6 & 4 & 3 \end{pmatrix} \tag{212}$$

$$\begin{pmatrix} \text{SG212} & a_1 & a_2 \\ \nu & 24 & 8 \\ n_{\Gamma,1} & 2 & 1 \\ n_{\Gamma,2} & 2 & 1 \\ n_{\Gamma,3} & 4 & 1 \\ n_{X,1} & 3 & 1 \\ n_{X,2} & 3 & 1 \\ n_{X,3} & 3 & 1 \\ n_{X,4} & 3 & 1 \\ n_{X,5} & 6 & 2 \\ n_{M,1} & 6 & 2 \\ n_{M,2} & 6 & 2 \\ n_{R,1} & 1 & 0 \\ n_{R,2} & 1 & 0 \\ n_{R,3} & 2 & 1 \\ n_{R,4} & 3 & 1 \\ n_{R,5} & 3 & 1 \end{pmatrix} \tag{213}$$

$$\begin{pmatrix} \text{SG213} & a_1 & a_2 \\ \nu & 24 & 8 \\ n_{\Gamma,1} & 2 & 1 \\ n_{\Gamma,2} & 2 & 1 \\ n_{\Gamma,3} & 4 & 1 \\ n_{X,1} & 3 & 1 \\ n_{X,2} & 3 & 1 \\ n_{X,3} & 3 & 1 \\ n_{X,4} & 3 & 1 \\ n_{X,5} & 6 & 2 \\ n_{M,1} & 6 & 2 \\ n_{M,2} & 6 & 2 \\ n_{R,1} & 1 & 0 \\ n_{R,2} & 1 & 0 \\ n_{R,3} & 2 & 1 \\ n_{R,4} & 3 & 1 \\ n_{R,5} & 3 & 1 \end{pmatrix} \tag{214}$$

$$\begin{pmatrix} \text{SG214} & a_1 & a_2 \\ \nu & 12 & 8 \\ n_{\Gamma,1} & 1 & 1 \\ n_{\Gamma,2} & 1 & 1 \\ n_{\Gamma,3} & 2 & 1 \\ n_{H,1} & 1 & 1 \\ n_{H,2} & 1 & 1 \\ n_{H,3} & 2 & 1 \\ n_{P,1} & 1 & 0 \\ n_{P,2} & 1 & 1 \\ n_{P,3} & 1 & 1 \\ n_{P,4} & 3 & 2 \\ n_{N,1} & 6 & 4 \end{pmatrix} \tag{215}$$

$$\begin{pmatrix}
 \text{SG215} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 12 & 4 & 6 & 6 & 2 & -12 \\
 n_{\Gamma,1} & 1 & 0 & 1 & 1 & 1 & -2 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 1 & 1 & 1 & 0 & -2 \\
 n_{X,1} & 3 & 1 & 2 & 1 & 1 & -4 \\
 n_{X,2} & 3 & 1 & 1 & 2 & 0 & -2 \\
 n_{M,1} & 3 & 1 & 1 & 2 & 1 & -4 \\
 n_{M,2} & 3 & 1 & 2 & 1 & 0 & -2 \\
 n_{R,1} & 1 & 0 & 1 & 1 & 0 & -2 \\
 n_{R,2} & 1 & 0 & 0 & 0 & 1 & 0 \\
 n_{R,3} & 2 & 1 & 1 & 1 & 0 & -2
 \end{pmatrix} \tag{216}$$

$$\begin{pmatrix}
 \text{SG216} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 12 & 4 & 2 & 2 & 2 & -4 \\
 n_{\Gamma,1} & 1 & 0 & 1 & 1 & 1 & -2 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 1 & 0 & 0 & 0 & 0 \\
 n_{X,1} & 3 & 1 & 1 & 1 & 0 & -2 \\
 n_{X,2} & 3 & 1 & 0 & 0 & 1 & 0 \\
 n_{L,1} & 2 & 1 & 0 & 0 & 0 & 0 \\
 n_{L,2} & 2 & 1 & 0 & 0 & 0 & 0 \\
 n_{L,3} & 4 & 1 & 1 & 1 & 1 & -2 \\
 n_{W,1} & 3 & 1 & 0 & 1 & 1 & -2 \\
 n_{W,2} & 3 & 1 & 0 & 1 & 0 & 0 \\
 n_{W,3} & 3 & 1 & 1 & 0 & 0 & 0 \\
 n_{W,4} & 3 & 1 & 1 & 0 & 1 & -2
 \end{pmatrix} \tag{217}$$

$$\begin{pmatrix}
 \text{SG217} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 12 & 12 & 4 & 6 & -20 \\
 n_{\Gamma,1} & 1 & 2 & 0 & 1 & -2 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 2 & 1 & 1 & -4 \\
 n_{H,1} & 1 & 0 & 0 & 1 & 0 \\
 n_{H,2} & 1 & 2 & 0 & 0 & -2 \\
 n_{H,3} & 2 & 2 & 1 & 1 & -4 \\
 n_{P,1} & 1 & 1 & 0 & 0 & 0 \\
 n_{P,2} & 1 & 1 & 0 & 1 & -2 \\
 n_{P,3} & 2 & 2 & 1 & 1 & -4 \\
 n_{N,1} & 6 & 6 & 2 & 3 & -10
 \end{pmatrix} \tag{218}$$

$$\begin{pmatrix}
 \text{SG218} & a_1 & a_2 & a_3 & a_4 \\
 \nu & 12 & 16 & 12 & 0 \\
 n_{\Gamma,1} & 1 & 2 & 2 & 0 \\
 n_{\Gamma,2} & 1 & 2 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 2 & 2 & 0 \\
 n_{X,1} & 3 & 4 & 3 & 0 \\
 n_{X,2} & 3 & 4 & 3 & 0 \\
 n_{M,1} & 3 & 4 & 2 & 2 \\
 n_{M,2} & 3 & 4 & 4 & -2 \\
 n_{R,1} & 1 & 2 & 1 & 0 \\
 n_{R,2} & 1 & 2 & 1 & 0 \\
 n_{R,3} & 1 & 1 & 1 & 0
 \end{pmatrix} \tag{219}$$

$$\begin{pmatrix}
 \text{SG219} & a_1 & a_2 & a_3 & a_4 \\
 \nu & 12 & 16 & 12 & 0 \\
 n_{\Gamma,1} & 1 & 2 & 2 & 0 \\
 n_{\Gamma,2} & 1 & 2 & 0 & 0 \\
 n_{\Gamma,3} & 2 & 2 & 2 & 0 \\
 n_{X,1} & 3 & 4 & 2 & 2 \\
 n_{X,2} & 3 & 4 & 4 & -2 \\
 n_{L,1} & 1 & 1 & 1 & 0 \\
 n_{L,2} & 1 & 1 & 1 & 0 \\
 n_{L,3} & 2 & 3 & 2 & 0 \\
 n_{W,1} & 3 & 4 & 3 & 0 \\
 n_{W,2} & 3 & 4 & 3 & 0 \\
 n_{W,3} & 3 & 4 & 3 & 0 \\
 n_{W,4} & 3 & 4 & 3 & 0
 \end{pmatrix} \tag{220}$$

$$\begin{pmatrix}
 \text{SG220} & a_1 & a_2 & a_3 \\
 \nu & 24 & 28 & -16 \\
 n_{\Gamma,1} & 2 & 3 & -2 \\
 n_{\Gamma,2} & 2 & 3 & -2 \\
 n_{\Gamma,3} & 4 & 4 & -2 \\
 n_{H,1} & 2 & 3 & -2 \\
 n_{H,2} & 2 & 3 & -2 \\
 n_{H,3} & 4 & 4 & -2 \\
 n_{P,1} & 1 & 1 & 0 \\
 n_{P,2} & 1 & 0 & 0 \\
 n_{P,3} & 2 & 3 & -2 \\
 n_{P,4} & 3 & 4 & -2 \\
 n_{P,5} & 3 & 3 & -2 \\
 n_{N,1} & 6 & 7 & -4 \\
 n_{N,2} & 6 & 7 & -4 \\
 n_{N,3} & 6 & 7 & -4 \\
 n_{N,4} & 6 & 7 & -4
 \end{pmatrix} \tag{221}$$

$$\begin{pmatrix}
 \text{SG221} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 & a_{10} & a_{11} & a_{12} & a_{13} & a_{14} \\
 \nu & 24 & 8 & 12 & 12 & 6 & 6 & 6 & 6 & 2 & -44 & -78 & 2 & 144 & -64 \\
 n_{\Gamma,1} & 1 & 0 & 1 & 1 & 1 & 0 & 1 & 0 & 1 & -6 & -9 & 1 & 16 & -8 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & -4 & -6 & 0 & 12 & -8 \\
 n_{\Gamma,3} & 2 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & -6 & -9 & 0 & 16 & -8 \\
 n_{\Gamma,4} & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & -2 & 0 & 4 & 0 \\
 n_{\Gamma,5} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,6} & 2 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & -2 & 0 & 4 & 0 \\
 n_{X,1} & 3 & 1 & 2 & 2 & 1 & 1 & 1 & 0 & 0 & -6 & -11 & 1 & 20 & -8 \\
 n_{X,2} & 3 & 1 & 1 & 1 & 1 & 0 & 1 & 0 & 0 & -5 & -8 & 0 & 16 & -8 \\
 n_{X,3} & 3 & 1 & 2 & 2 & 1 & 0 & 1 & 1 & 1 & -6 & -11 & 0 & 20 & -8 \\
 n_{X,4} & 3 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 0 & -5 & -9 & 0 & 16 & -8 \\
 n_{M,1} & 3 & 1 & 1 & 2 & 1 & 0 & 0 & 1 & 0 & -5 & -9 & 1 & 16 & -8 \\
 n_{M,2} & 3 & 1 & 2 & 1 & 0 & 1 & 1 & 0 & 1 & -5 & -8 & 0 & 16 & -8 \\
 n_{M,3} & 3 & 1 & 1 & 2 & 1 & 1 & 1 & 0 & 0 & -6 & -11 & 0 & 20 & -8 \\
 n_{M,4} & 3 & 1 & 2 & 1 & 1 & 1 & 1 & 0 & 0 & -6 & -11 & 0 & 20 & -8 \\
 n_{R,1} & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & -5 & -7 & 1 & 12 & -8 \\
 n_{R,2} & 1 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & -2 & 0 & 4 & 0 \\
 n_{R,3} & 2 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & -1 & -5 & 0 & 8 & 0 \\
 n_{R,4} & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & -2 & 0 & 4 & 0 \\
 n_{R,5} & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 1 & -5 & -6 & 0 & 12 & -8 \\
 n_{R,6} & 2 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & -5 & -6 & 0 & 12 & -8
 \end{pmatrix} \tag{222}$$

$$\begin{pmatrix}
 \text{SG222} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 \\
 \nu & 24 & 16 & 12 & 24 & 16 & -64 \\
 n_{\Gamma,1} & 1 & 1 & 1 & 2 & 2 & -8 \\
 n_{\Gamma,2} & 1 & 1 & 0 & 0 & 2 & -4 \\
 n_{\Gamma,3} & 2 & 1 & 1 & 2 & 2 & -4 \\
 n_{\Gamma,4} & 1 & 1 & 1 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 1 & 0 & 2 & 0 & -4 \\
 n_{\Gamma,6} & 2 & 1 & 1 & 2 & 0 & -4 \\
 n_{X,1} & 3 & 2 & 2 & 3 & 2 & -8 \\
 n_{X,2} & 3 & 2 & 2 & 3 & 2 & -8 \\
 n_{X,3} & 3 & 2 & 1 & 3 & 2 & -8 \\
 n_{X,4} & 3 & 2 & 1 & 3 & 2 & -8 \\
 n_{M,1} & 6 & 4 & 3 & 6 & 4 & -16 \\
 n_{R,1} & 2 & 2 & 1 & 2 & 2 & -8 \\
 n_{R,2} & 2 & 1 & 1 & 2 & 1 & -4 \\
 n_{R,3} & 2 & 1 & 1 & 2 & 1 & -4
 \end{pmatrix} \tag{223}$$

$$\left(\begin{array}{c|cccccccc} \text{SG223} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & \\ \hline \nu & 24 & 16 & 12 & 12 & 12 & 4 & -64 & \\ n_{\Gamma,1} & 1 & 1 & 1 & 1 & 1 & 1 & -8 & \\ n_{\Gamma,2} & 1 & 1 & 0 & 0 & 1 & 1 & -4 & \\ n_{\Gamma,3} & 2 & 1 & 1 & 1 & 2 & 0 & -4 & \\ n_{\Gamma,4} & 1 & 1 & 0 & 0 & 0 & 0 & 0 & \\ n_{\Gamma,5} & 1 & 1 & 1 & 1 & 0 & 0 & -4 & \\ n_{\Gamma,6} & 2 & 1 & 1 & 1 & 0 & 0 & -4 & \\ n_{X,1} & 6 & 4 & 3 & 3 & 3 & 1 & -16 & \\ n_{M,1} & 3 & 2 & 2 & 1 & 1 & 1 & -8 & \\ n_{M,2} & 3 & 2 & 1 & 2 & 1 & 1 & -8 & \\ n_{M,3} & 3 & 2 & 1 & 2 & 2 & 0 & -8 & \\ n_{M,4} & 3 & 2 & 2 & 1 & 2 & 0 & -8 & \\ n_{R,1} & 2 & 2 & 1 & 1 & 1 & 1 & -8 & \\ n_{R,2} & 2 & 1 & 1 & 1 & 1 & 0 & -4 & \\ n_{R,3} & 2 & 1 & 1 & 1 & 1 & 0 & -4 & \end{array} \right) \quad (224)$$

$$\left(\begin{array}{c|cccccccc} \text{SG224} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & \\ \hline \nu & 24 & 8 & 12 & -32 & 8 & -64 & 72 & -80 & \\ n_{\Gamma,1} & 1 & 0 & 1 & -2 & 1 & -3 & 4 & -4 & \\ n_{\Gamma,2} & 1 & 0 & 0 & -2 & 1 & -3 & 4 & -4 & \\ n_{\Gamma,3} & 2 & 1 & 1 & -4 & 1 & -9 & 10 & -12 & \\ n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \\ n_{\Gamma,5} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & \\ n_{\Gamma,6} & 2 & 1 & 1 & -2 & 0 & -4 & 4 & -4 & \\ n_{X,1} & 6 & 2 & 3 & -8 & 2 & -16 & 18 & -20 & \\ n_{M,1} & 6 & 2 & 3 & -8 & 2 & -16 & 18 & -20 & \\ n_{R,1} & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & \\ n_{R,2} & 1 & 0 & 1 & -2 & 0 & -3 & 4 & -4 & \\ n_{R,3} & 2 & 1 & 1 & -3 & 0 & -5 & 6 & -8 & \\ n_{R,4} & 1 & 0 & 1 & -2 & 1 & -4 & 4 & -4 & \\ n_{R,5} & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & \\ n_{R,6} & 2 & 1 & 1 & -3 & 1 & -8 & 8 & -8 & \end{array} \right) \quad (225)$$

$$\left(\begin{array}{c|cccccccccccc} \text{SG225} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 & a_{10} & a_{11} & \\ \hline \nu & 24 & 8 & 12 & 12 & 4 & 2 & 2 & 4 & 2 & -130 & -256 & \\ n_{\Gamma,1} & 1 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & -13 & -24 & \\ n_{\Gamma,2} & 1 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & -4 & -8 & \\ n_{\Gamma,3} & 2 & 1 & 1 & 2 & 0 & 0 & 0 & 1 & 0 & -12 & -24 & \\ n_{\Gamma,4} & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & -4 & -8 & \\ n_{\Gamma,5} & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & -4 & -8 & \\ n_{\Gamma,6} & 2 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & -8 & -16 & \\ n_{X,1} & 3 & 1 & 2 & 1 & 0 & 1 & 0 & 1 & 1 & -21 & -40 & \\ n_{X,2} & 3 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 0 & -16 & -32 & \\ n_{X,3} & 3 & 1 & 2 & 2 & 1 & 0 & 0 & 0 & 0 & -16 & -32 & \\ n_{X,4} & 3 & 1 & 1 & 2 & 0 & 0 & 0 & 0 & 0 & -12 & -24 & \\ n_{L,1} & 2 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & -8 & -16 & \\ n_{L,2} & 2 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & -8 & -16 & \\ n_{L,3} & 4 & 1 & 2 & 2 & 1 & 0 & 0 & 0 & 1 & -20 & -40 & \\ n_{L,4} & 2 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & 0 & -12 & -24 & \\ n_{L,5} & 2 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & 0 & -12 & -24 & \\ n_{L,6} & 4 & 1 & 2 & 2 & 1 & 1 & 1 & 1 & 0 & -25 & -48 & \\ n_{W,1} & 6 & 2 & 3 & 3 & 1 & 1 & 0 & 1 & 0 & -32 & -64 & \\ n_{W,2} & 6 & 2 & 3 & 3 & 1 & 0 & 1 & 1 & 1 & -33 & -64 & \end{array} \right) \quad (226)$$

$$\begin{pmatrix}
 \text{SG226} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 \\
 \nu & 24 & 16 & 12 & 12 & -112 & 12 & 4 & -224 \\
 n_{\Gamma,1} & 1 & 1 & 1 & 2 & -9 & 1 & 1 & -16 \\
 n_{\Gamma,2} & 1 & 1 & 0 & 0 & -7 & 0 & 1 & -16 \\
 n_{\Gamma,3} & 2 & 1 & 1 & 2 & -8 & 1 & 0 & -16 \\
 n_{\Gamma,4} & 1 & 1 & 1 & 0 & -4 & 0 & 0 & -8 \\
 n_{\Gamma,5} & 1 & 1 & 0 & 0 & -4 & 1 & 0 & -8 \\
 n_{\Gamma,6} & 2 & 1 & 1 & 0 & -8 & 1 & 0 & -16 \\
 n_{X,1} & 3 & 2 & 2 & 2 & -13 & 1 & 1 & -24 \\
 n_{X,2} & 3 & 2 & 1 & 0 & -15 & 2 & 1 & -32 \\
 n_{X,3} & 3 & 2 & 2 & 2 & -16 & 2 & 0 & -32 \\
 n_{X,4} & 3 & 2 & 1 & 2 & -12 & 1 & 0 & -24 \\
 n_{L,1} & 2 & 1 & 1 & 1 & -8 & 1 & 0 & -16 \\
 n_{L,2} & 4 & 3 & 2 & 2 & -20 & 2 & 1 & -40 \\
 n_{L,3} & 4 & 3 & 2 & 2 & -20 & 2 & 1 & -40 \\
 n_{W,1} & 6 & 4 & 3 & 3 & -28 & 3 & 1 & -56 \\
 n_{W,2} & 6 & 4 & 3 & 3 & -28 & 3 & 1 & -56
 \end{pmatrix}
 \tag{227}$$

$$\begin{pmatrix}
 \text{SG227} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 \\
 \nu & 24 & 8 & 8 & 8 & -24 & 8 & 4 & -48 \\
 n_{\Gamma,1} & 1 & 0 & 0 & 1 & -2 & 1 & 1 & -4 \\
 n_{\Gamma,2} & 1 & 0 & 0 & 1 & -2 & 1 & 0 & -4 \\
 n_{\Gamma,3} & 2 & 1 & 2 & 1 & -4 & 1 & 0 & -8 \\
 n_{\Gamma,4} & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\
 n_{\Gamma,6} & 2 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 n_{X,1} & 6 & 2 & 2 & 2 & -6 & 2 & 1 & -12 \\
 n_{L,1} & 2 & 1 & 1 & 1 & -2 & 0 & 0 & -4 \\
 n_{L,2} & 2 & 1 & 1 & 1 & -2 & 0 & 0 & -4 \\
 n_{L,3} & 4 & 1 & 2 & 2 & -5 & 1 & 1 & -8 \\
 n_{L,4} & 2 & 1 & 1 & 0 & -2 & 1 & 0 & -4 \\
 n_{L,5} & 2 & 1 & 1 & 0 & -2 & 1 & 0 & -4 \\
 n_{L,6} & 4 & 1 & 0 & 1 & -3 & 2 & 1 & -8 \\
 n_{W,1} & 3 & 1 & 1 & 1 & -2 & 1 & 0 & -4 \\
 n_{W,2} & 3 & 1 & 1 & 1 & -2 & 1 & 0 & -4 \\
 n_{W,3} & 3 & 1 & 1 & 1 & -4 & 1 & 1 & -8 \\
 n_{W,4} & 3 & 1 & 1 & 1 & -4 & 1 & 1 & -8 \\
 n_{W,5} & 6 & 2 & 2 & 2 & -6 & 2 & 1 & -12
 \end{pmatrix}
 \tag{228}$$

$$\begin{pmatrix} \text{SG228} & a_1 & a_2 & a_3 & a_4 & a_5 \\ \nu & 24 & 16 & 24 & 16 & -64 \\ n_{\Gamma,1} & 1 & 1 & 2 & 2 & -8 \\ n_{\Gamma,2} & 1 & 1 & 0 & 2 & -4 \\ n_{\Gamma,3} & 2 & 1 & 2 & 2 & -4 \\ n_{\Gamma,4} & 1 & 1 & 0 & 0 & 0 \\ n_{\Gamma,5} & 1 & 1 & 2 & 0 & -4 \\ n_{\Gamma,6} & 2 & 1 & 2 & 0 & -4 \\ n_{X,1} & 6 & 4 & 6 & 4 & -16 \\ n_{L,1} & 2 & 1 & 2 & 1 & -4 \\ n_{L,2} & 4 & 3 & 4 & 3 & -12 \\ n_{L,3} & 4 & 3 & 4 & 3 & -12 \\ n_{W,1} & 3 & 2 & 3 & 2 & -8 \\ n_{W,2} & 3 & 2 & 3 & 2 & -8 \\ n_{W,3} & 3 & 2 & 3 & 2 & -8 \\ n_{W,4} & 3 & 2 & 3 & 2 & -8 \\ n_{W,5} & 3 & 2 & 3 & 2 & -8 \end{pmatrix} \tag{229}$$

$$\begin{pmatrix} \text{SG229} & a_1 & a_2 & a_3 & a_4 & a_5 & a_6 & a_7 & a_8 & a_9 & a_{10} & a_{11} \\ \nu & 24 & 8 & 12 & 12 & -360 & 8 & 6 & 6 & 2 & 204 & -256 \\ n_{\Gamma,1} & 1 & 0 & 1 & 1 & -34 & 1 & 1 & 0 & 1 & 18 & -24 \\ n_{\Gamma,2} & 1 & 0 & 0 & 0 & -10 & 1 & 0 & 1 & 0 & 4 & -8 \\ n_{\Gamma,3} & 2 & 1 & 1 & 1 & -32 & 1 & 1 & 1 & 0 & 16 & -24 \\ n_{\Gamma,4} & 1 & 0 & 1 & 0 & -12 & 0 & 0 & 0 & 0 & 8 & -8 \\ n_{\Gamma,5} & 1 & 0 & 0 & 1 & -12 & 0 & 0 & 0 & 0 & 8 & -8 \\ n_{\Gamma,6} & 2 & 1 & 1 & 1 & -24 & 0 & 0 & 0 & 0 & 16 & -16 \\ n_{H,1} & 1 & 0 & 1 & 0 & -23 & 0 & 1 & 0 & 1 & 12 & -16 \\ n_{H,2} & 1 & 0 & 0 & 1 & -11 & 0 & 0 & 1 & 0 & 6 & -8 \\ n_{H,3} & 2 & 1 & 1 & 1 & -23 & 0 & 1 & 1 & 0 & 12 & -16 \\ n_{H,4} & 1 & 0 & 1 & 1 & -23 & 1 & 0 & 0 & 0 & 14 & -16 \\ n_{H,5} & 1 & 0 & 0 & 0 & -11 & 1 & 0 & 0 & 0 & 6 & -8 \\ n_{H,6} & 2 & 1 & 1 & 1 & -33 & 1 & 0 & 0 & 0 & 20 & -24 \\ n_{P,1} & 2 & 0 & 1 & 1 & -34 & 1 & 1 & 0 & 0 & 20 & -24 \\ n_{P,2} & 2 & 0 & 1 & 1 & -34 & 1 & 0 & 1 & 1 & 18 & -24 \\ n_{P,3} & 4 & 2 & 2 & 2 & -56 & 1 & 1 & 1 & 0 & 32 & -40 \\ n_{N,1} & 6 & 2 & 3 & 3 & -90 & 2 & 1 & 1 & 1 & 52 & -64 \\ n_{N,2} & 6 & 2 & 3 & 3 & -90 & 2 & 2 & 2 & 0 & 50 & -64 \end{pmatrix} \tag{230}$$

$$\begin{pmatrix}
 \text{SG230} & a_1 & a_2 & a_3 & a_4 & a_5 \\
 \nu & 24 & 16 & 24 & 16 & -64 \\
 n_{\Gamma,1} & 1 & 1 & 2 & 2 & -8 \\
 n_{\Gamma,2} & 1 & 1 & 0 & 2 & -4 \\
 n_{\Gamma,3} & 2 & 1 & 2 & 2 & -4 \\
 n_{\Gamma,4} & 1 & 1 & 0 & 0 & 0 \\
 n_{\Gamma,5} & 1 & 1 & 2 & 0 & -4 \\
 n_{\Gamma,6} & 2 & 1 & 2 & 0 & -4 \\
 n_{\text{H},1} & 2 & 2 & 2 & 2 & -8 \\
 n_{\text{H},2} & 2 & 1 & 2 & 1 & -4 \\
 n_{\text{H},3} & 2 & 1 & 2 & 1 & -4 \\
 n_{\text{P},1} & 1 & 0 & 1 & 0 & 0 \\
 n_{\text{P},2} & 1 & 0 & 1 & 0 & 0 \\
 n_{\text{P},3} & 2 & 2 & 2 & 2 & -8 \\
 n_{\text{P},4} & 3 & 2 & 3 & 2 & -8 \\
 n_{\text{P},5} & 3 & 2 & 3 & 2 & -8 \\
 n_{\text{N},1} & 6 & 4 & 6 & 4 & -16 \\
 n_{\text{N},2} & 6 & 4 & 6 & 4 & -16
 \end{pmatrix} \tag{231}$$

VI. WEBSITE FOR BAND STRUCTURES

The band structures computed for all of the discovered topological materials candidates can be found on the following website:

ccmp.nju.edu.cn

While the materials are grouped by their topological diagnosis and space groups, the database is also searchable. However, in searching one has to pay special attention to the naming convention adopted. For instance, the entry for Na_3Bi can be found by any one of the following search prompts:

- “Bi1Na3”
- “Bi Na”
- “Na Bi”

Note, however, the prompts “Na3Bi”, “Na3Bi1”, and “BiNa3” will not return the correct result.

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- [1] H. Po, A. Vishwanath, and H. Watanabe, *Nature Communications* **8**, 50 (2017).
[2] F. Tang, H. Po, A. Vishwanath, and X. Wan, arXiv: 1805.07314 (2018).
[3] Z. Song, T. Zhang, Z. Fang, and C. Fang, arXiv:1711.11049 (2017).
[4] A. Yamakage, Y. Yamakawa, Y. Tanaka, and Y. Okamoto, *Journal of the Physical Society of Japan* **85**, 013708 (2015).
[5] R. Fischer and B. Müller, *Zeitschrift für anorganische und allgemeine Chemie* **628**, 2592 (2002).
[6] W. Bauhofer, M. Wittmann, and H. Schnering, *Journal of Physics and Chemistry of Solids* **42**, 687 (1981).
[7] Y. Quan, Z. Yin, and W. Pickett, *Physical review letters* **118**, 176402 (2017).
[8] J. F. Brice, A. Courtois, and P. Laffitte, *Comptes Rendus Hebdomadaires des Seances de l’Academie des Sciences, Serie C, Sciences Chimiques* (1966-) **283**, 479 (1976).
[9] Q. Xu, R. Yu, Z. Fang, X. Dai, and H. Weng, *Physical Review B* **95**, 045136 (2017).
[10] P. Malinowski, M. Derzsi, Z. Mazej, Z. Jaglicic, B. Gawel, W. Lasocha, and W. Grochala, *Angewandte Chemie. International Edition* **49**, 1683 (2010).
[11] M. Ströbele and H.-J. Meyer, *Russian Journal of Coordination Chemistry* **38**, 178 (2012).
[12] F. Kubel and K. Yvon, *Solid state communications* **72**, 1219 (1989).
[13] W. Dahlmann and H. Schnering, *Naturwissenschaften* **60**, 518 (1973).
[14] A. Hermann, B. L. Ivanov, N. W. Ashcroft, and R. Hoffmann, *Physical Review B* **86**, 014104 (2012).
[15] K. Deller and B. Eisenmann, *Zeitschrift fuer Anorganische und Allgemeine Chemie* (1950) (DE) **425**, 104 (1976).

- [16] Y. Prots, R. Demchyna, U. Burkhardt, and U. Schwarz, *Zeitschrift für Kristallographie* **222**, 513 (2007).
- [17] L. Brattas and A. Kjekshus, *Acta Chemica Scandinavica* **26**, 3441 (1972).
- [18] W. Schutte, F. Disselborg, and J. De Boer, *Acta Crystallographica Section B* **49**, 787 (1993).
- [19] F. Kadijk, R. Huisman, and F. Jellinek, *Acta Crystallographica Section B* **24**, 1102 (1968).
- [20] Y. Ma, Y. Jing, and T. Heine, *2D Materials* **4**, 025111 (2017).
- [21] W. Bronger and C. Burschka, *Zeitschrift für anorganische und allgemeine Chemie* **425**, 109 (1976).
- [22] M. Wendorff and C. Roehr, *Zeitschrift Fr Naturforschung B* **62**, 1071 (2007).
- [23] K. Schubert, H. G. Meissner, A. Raman, and W. Rossteutscher, *Naturwissenschaften* **51**, 287 (1964).
- [24] W. Bauhofer, M. Wittmann, and H. Schnering, *Journal of Physics and Chemistry of Solids* **42**, 687 (1981).
- [25] K. Deller and B. Eisenmann, *Zeitschrift Fr Naturforschung B* **31**, 1550 (2014).
- [26] W. Jeitschko and M. Moeller, *Acta Crystallographica* **35**, 573 (1979).
- [27] K. Deller and B. Eisenmann, *Cheminform* **9**, 676 (1978).
- [28] B. Saparov, H. He, X. Zhang, R. Greene, and S. Bobev, *Dalton Trans* **39**, 1063 (2010).
- [29] T. Hansen and H. Müller-Buschbaum, *Zeitschrift für anorganische und allgemeine Chemie* **616**, 67 (1992).
- [30] S. Bobev and S. C. Sevov, *Cheminform* **338**, 87 (2002).
- [31] J. C. Dai, S. Gupta, and J. D. Corbett, *Inorganic Chemistry* **50**, 238 (2011).
- [32] S.-Q. Xia and S. Bobev, *Inorganic chemistry* **45**, 7126 (2006).
- [33] P. Berlepsch, T. Armbruster, E. Makovicky, T. Dan, and S. Graeser, *Canadian Mineralogist* **39**, 1653 (2001).
- [34] A. Olvera, G. Shi, H. Djieutedjeu, A. Page, C. Uher, E. Kioupakis, and P. F. Poudeu, *Inorganic chemistry* **54**, 746 (2014).
- [35] P. Heines, H. Keller, M. Armbruster, U. Schwarz, and J. Tse, *Inorganic Chemistry* **45**, 9818 (2006).
- [36] R. Jha, B. Tiwari, P. Rani, H. Kishan, and V. Awana, *Journal of Applied Physics* **115**, 213903 (2014).
- [37] D. A. Keszler, P. J. Squattrito, N. E. Brese, J. A. Ibers, M. Shang, and L. U. Jiaxi, *Inorganic Chemistry* **24**, 3063 (1985).
- [38] W. Dahlmann and H. G. V. Schnering, *Naturwissenschaften* **60**, 429 (1973).
- [39] S. A. Sunshine and J. A. Ibers, *Inorganic Chemistry* **25**, 4355 (1986).
- [40] A. van der Lee and J. de Boer, *Acta Crystallographica, Section C: Crystal Structure Communications* **49**, 1444 (1993).
- [41] W. Zhang, R. Yu, W. Feng, Y. Yao, H. Weng, X. Dai, and Z. Fang, *Phys. Rev. Lett.* **106**, 156808 (2011).
- [42] E. Schulz Lang, U. Abram, and J. Straehle, *Zeitschrift fuer Anorganische und Allgemeine Chemie (1950) (DE)* **623**, 1791 (1997).
- [43] H. Diercks and B. Krebs, *Angewandte Chemie (Edition international)* **16**, 313 (1977).
- [44] S. Sirotkin, V. Sirotkin, and V. Trunov, *Zhurnal Neorganicheskoi Khimii* **35**, 1609 (1990).
- [45] W. Jeitschko and P. Donohue, *Acta Crystallographica B (24,1968-38,1982)* **28**, 1893 (1972).
- [46] K. Tanaka, T. Nasu, Y. Miyamoto, N. Ozaki, S. Tanaka, T. Nagata, F. Hakoe, M. Yoshikiyo, K. Nakagawa, Y. Umeta, K. Imoto, H. Tokoro, A. Namai, and S.-i. Ohkoshi, *Crystal Growth and Design* **15**, 653 (2015).
- [47] T. Chattopadhyay and K. Schubert, *Journal of the Less Common Metals* **45**, 79 (1976).
- [48] H. Haendler, D. Mootz, A. Rabenau, and G. Rosenstein, *Journal of Solid State Chemistry* **10**, 175 (1974).
- [49] B. Li, S.-J. Kim, G. J. Miller, and J. D. Corbett, *Inorganic chemistry* **48**, 6573 (2009).
- [50] Z.-M. Sun, J.-G. Mao, and D.-C. Pan, *Journal of alloys and compounds* **421**, 190 (2006).
- [51] F. Hulliger, *Nature* **204**, 991 (1964).
- [52] Y. G. G. Yu and N. Ross, *Journal of Physics: Condensed Matter* **23**, 055401 (2011).
- [53] W. Burkhardt and K. Schubert, *Zeitschrift Fur Metallkunde* **50**, 442 (1959).
- [54] U. Zachwieja, J. Müller, and J. Wlodarski, *Zeitschrift für anorganische und allgemeine Chemie* **624**, 853 (1998).
- [55] L. M. Schoop, L. S. Xie, R. Chen, Q. D. Gibson, S. H. Lapidus, I. Kimchi, M. Hirschberger, N. Haldolaarachchige, M. N. Ali, C. A. Belvin, *et al.*, *Physical Review B* **91**, 214517 (2015).
- [56] S. Filatov, N. Bendeliani, B. Albert, J. Kopf, T. Dyuzeva, and L. Lityagina, *Solid state sciences* **7**, 1363 (2005).
- [57] B. Krenkel, C. Tiburtius, and H. U. Schuster, *Zeitschrift Fr Naturforschung B* **34**, 1686 (1979).
- [58] S. Rundqvist, B. Carlsson, B. Olofsson, and P. H. Nielsen, *Acta Chemica Scandinavica* **22**, 2395 (1968).
- [59] P. E. Blanchard, R. G. Cavell, and A. Mar, *Journal of Alloys and Compounds* **505**, 17 (2010).
- [60] F. Kabir, M. M. Hosen, G. Dhakal, K. Dimitri, T.-R. Chang, C. Sims, H. Lin, T. Durakiewicz, D. Kaczorowski, and M. Neupane, *Bulletin of the American Physical Society* (2018).
- [61] K. Guttsche, A. Rosin, M. Wendorff, and C. Roehr, *Zeitschrift fuer Naturforschung, B: Chemical Sciences* **61**, 846 (2006).
- [62] Y. Imai, Y. Mori, S. Nakamura, and K. I. Takarabe, *Journal of Alloys and Compounds* **590**, 579 (2014).
- [63] Z. Zhu, M. Li, and J. Li, *Physical Review B* **94**, 155121 (2016).
- [64] A. Velden and M. J. Dr, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **630**, (2010).
- [65] F. Merlo, M. Pani, and M. L. Fornasini, *Journal of the Less Common Metals* **171**, 145 (1991).
- [66] G. Savelsberg and H. Schaefer, *Chemischer Informationsdienst* **9** (1978).
- [67] B. Yan, L. Muehler, and C. Felser, *Physical review letters* **109**, 116406 (2012).
- [68] N. H. Dung, *Acta Crystallographica* **29**, 2095C2097 (1973).
- [69] Y. Nagata, K. Sodeyama, S. Yashiro, H. Sasaki, H. Samata, T. Uchida, and M. D. Lan, *Journal of Alloys and Compounds* **281**, 112 (1998).
- [70] B. Singh, X. Zhou, H. Lin, and A. Bansil, *Physical Review B* **97**, 075125 (2018).
- [71] Y. P. Yarmolyuk and E. I. Gladishevskii, **36**, 1030 (1974).

- [72] V. Johnson and W. Jeitschko, *Journal of Solid State Chemistry* **4**, 123 (1972).
- [73] J. Lian, L. Yu, Q.-F. Liang, J. Zhou, R. Yu, and H. Weng, arXiv preprint arXiv:1807.06247 (2018).
- [74] S. V. Ackerbauer, R. Gumeniuk, Y. Prots, H. Borrmann, F. Weitzer, and A. Leithejasper, *Zeitschrift fr Kristallographie - New Crystal Structures* **225**, 7 (2010).
- [75] E. Ganglberger, H. Nowotny, and F. Benesovsky, *Monatshefte Fr Chemie Und Verwandte Teile Anderer Wissenschaften* **98**, 95 (1967).
- [76] J. G. Mao, Z. Xu, and A. M. Guloy, *Inorganic Chemistry* **40**, 4472 (2001).
- [77] A. Brown, *Nature* **206**, 502 (1965).
- [78] S. Popova, *Fizika Tekhnika Vysokikh Davlenij* **11**, 3 (1983).
- [79] G. A. Marking and H. F. Franzen, *Journal of Alloys and Compounds* **204**, L17CL20 (1994).
- [80] F. Hulliger, *Nature* **204**, 775 (1964).
- [81] H. Sprenger, *Journal of The Less-Common Metals* **34**, 39 (1974).
- [82] O. V. Yakubovich, I. V. Perevoznikova, and O. V. Dimitrova, *Doklady Physics* **47**, 791 (2002).
- [83] A. Salamat, K. Woodhead, S. I. Shah, A. L. Hector, and P. F. Mcmillan, *Chemical Communications* **50**, 10041 (2014).
- [84] A. Imre and A. Mewis, *Cheminform* **38**, 1153 (2007).
- [85] M. Huber and H. J. Deiseroth, *Zeitschrift Fr Kristallographie* **209**, 370 (1994).
- [86] P. Snell, *Acta Chem Scand* **22**, 1942 (1968).
- [87] G. Bruzzone and E. Franceschi, *Journal of the Less Common Metals* **57**, 201 (1978).
- [88] Y. Sun, X.-Q. Chen, C. Franchini, D. Li, S. Yunoki, Y. Li, and Z. Fang, *Physical Review B* **84**, 165127 (2011).
- [89] V. Johnson and W. Jeitschko, *Journal of Solid State Chemistry* **4**, 123 (1972).
- [90] S. V. Ackerbauer, R. Gumeniuk, Y. Prots, H. Borrmann, F. Weitzer, and A. Leithejasper, *Zeitschrift fr Kristallographie - New Crystal Structures* **225**, 7 (2010).
- [91] E. Brechtel, G. Cordier, and H. Schaefer, *Zeitschrift Fr Naturforschung B* **34**, 251 (1979).
- [92] K. Wang, L. Wang, D. Graf, and C. Petrovic, in *APS March Meeting Abstracts* (2013).
- [93] S. Brutti, D. Nguyen-Manh, and D. G. Pettifor, *Journal of Alloys and Compounds* **457**, 29 (2008).
- [94] S. V. Ackerbauer, R. Gumeniuk, Y. Prots, H. Borrmann, F. Weitzer, and A. Leithejasper, *Zeitschrift fr Kristallographie - New Crystal Structures* **225**, 7 (2010).
- [95] F. Hulliger, *Journal of Alloys and Compounds* **196**, 225 (1993).
- [96] E. Hovestreydt, N. Engel, K. Klepp, B. Chabot, and E. Parthe, *Journal of the Less-Common Metals* **85**, 247 (1982).
- [97] A. Imre and A. Mewis, *Zeitschrift fuer Naturforschung, B: Chemical Sciences* **62**, 1153 (2007).
- [98] R. E. Marsh, *Journal of Solid State Chemistry* **102**, 283 (1993).
- [99] M. Ade and H. Hillebrecht, *Inorganic chemistry* **54**, 6122 (2015).
- [100] S. Yamanaka, M. Kajiyama, S. N. Sivakumar, and H. Fukuoka, *High Pressure Research* **24**, 481 (2004).
- [101] H. Haendler, D. Mootz, A. Rabenau, and G. Rosenstein, *Journal of Solid State Chemistry* **10**, 175 (1974).
- [102] S. Mikhaleenko, N. Chaban, and B. Kuz'ma Yu, *Inorg. Mater.* **28**, 1700 (1992).
- [103] I. M. Kurylyshyn, T. F. Fässler, A. Fischer, C. Hauf, G. Eickerling, M. Presnitz, and W. Scherer, *Angewandte Chemie International Edition* **53**, 3029 (2014).
- [104] M. de Koning, A. Antonelli, and D. A. C. Jara, *Physical Review B* **80**, 045209 (2009).
- [105] F. Cheviré and F. J. Disalvo, *Acta Crystallographica Section E: Structure Reports Online* **63**, i62 (2007).
- [106] W. Xing, X.-Q. Chen, D. Li, Y. Li, C. L. Fu, S. Meschel, and X. Ding, *Intermetallics* **28**, 16 (2012).
- [107] H. Fjellvåg and A. Kjekshus, *Solid State Communications* **60**, 91 (1986).
- [108] H. Weng, X. Dai, and Z. Fang, *Physical review X* **4**, 011002 (2014).
- [109] A. Leineweber and H. Jacobs, *Journal of Alloys and Compounds* **278**, L10 (278).
- [110] I. Duerr, B. Bauer, and C. Roehr, *Zeitschrift fuer Naturforschung, B: Chemical Sciences* **66**, 1107 (2011).
- [111] A. Dwight, J. Downey, and R. Conner, *Acta Crystallographica (1,1948-23,1967)* **23**, 860 (1967).
- [112] V. Pavlyuk, O. Bodak, V. Pecharskii, R. Skolozdra, and E. Gladyshevskii, *Inorganic Materials* **25**, 962 (1989).
- [113] P. Smith, A. Leadbetter, and A. Apling, *Philosophical Magazine* **31**, 57 (1975).
- [114] A. Saengdeejing, Y. Wang, and Z. Liu, *Physica C: Superconductivity* **471**, 553 (2011).
- [115] K. Cenzual, L. M. Gelato, M. Penzo, and E. Parthé, *Acta Crystallographica Section B* **47**, 433 (1991).
- [116] F. Zürcher and R. Nesper, *Angewandte Chemie International Edition* **37**, 3314 (1998).
- [117] R. Macaluso, S. Nakatsuji, K. Kuga, E. Thomas, Y. Machida, Y. Maeno, Z. Fisk, and J.-Y. Chan, *Jinlin Daxue Ziran Kexue Xuebao* **19**, 1918 (2007).
- [118] F. Weitzer, K. Hiebl, and P. Rogl, *Jinlin Daxue Ziran Kexue Xuebao* **98**, 291 (1992).
- [119] O. Levy, G. L. Hart, and S. Curtarolo, *Physical Review B* **81**, 174106 (2010).
- [120] F. Q. Huang, C. Flaschenriem, P. Brazis, C. R. Kannewurf, and J. A. Ibers, *Inorganic chemistry* **42**, 3194 (2003).
- [121] H. Putz, J. Schön, and M. Jansen, *Zeitschrift für anorganische und allgemeine Chemie* **625**, 1624 (1999).
- [122] K. Aurivillius, *Arkiv foer Kemi* **28**, 279 (1968).
- [123] M. He, A. Simon, and V. Duppel, *Zeitschrift für Naturforschung B* **60**, 284 (2005).
- [124] M. He, A. Simon, and V. Duppel, *Zeitschrift für anorganische und allgemeine Chemie* **630**, 535 (2004).
- [125] H. Sodeck, H. Mikler, and K. L. Komarek, *Monatshefte für Chemie/Chemical Monthly* **110**, 1 (1979).
- [126] Z. Johan and P. Picot, *Bull. Mineral* **105**, 229 (1982).
- [127] Y. Yu, B. Zhao, S. Zhu, T. Gao, H. Hou, and Z. He, *Physica B: Condensed Matter* **417**, 83 (2013).
- [128] A. Vaipolin, *Fizika Tverdogo Tela* **15**, 1430 (1973).

- [129] I. Kozhina and A. Borshchevskii, High-temperature X-Ray research on A (2) B (4) C (5) 2 compounds Transl. into ENGLISH from Vestn, Leningrad. Univ.(USSR) v. 22, no. 4, 1971 p 87-92 (1974).
- [130] A. Continenza, S. Massidda, A. Freeman, T. De Pascale, F. Meloni, and M. Serra, Physical Review B **46**, 10070 (1992).
- [131] F. Zuercher, S. Wengert, and R. Nesper, Inorganic Chemistry **38**, 4567 (1999).
- [132] W. Zhang, A. R. Oganov, A. F. Goncharov, Q. Zhu, S. E. Boulfelfel, A. O. Lyakhov, E. Stavrou, M. Somayazulu, V. B. Prakapenka, and Z. Konopkova, Science **342**, 1502 (2013).
- [133] H. Klesnar and P. Rogl, High Temperatures. High Pressures **22**, 453 (1990).
- [134] I. Chung, J.-H. Song, J. Im, J. Androulakis, C. D. Malliakas, H. Li, A. J. Freeman, J. T. Kenney, and M. G. Kanatzidis, Journal of the American Chemical Society **134**, 8579 (2012).
- [135] H. Jin, J. Im, and A. J. Freeman, Physical Review B **86**, 121102 (2012).
- [136] R. Gohle and K. Schubert, ZEITSCHRIFT FUR METALLKUNDE **55**, 503 (1964).
- [137] K. Kato, I. Kawada, C. Oshima, and S. Kawai, Acta Crystallographica B (24,1968-38,1982) **30**, 2933 (1974).
- [138] Z. Fisk, A. Cooper, P. Schmidt, and R. Castellano, Materials Research Bulletin **7**, 285 (1972).
- [139] K. Schubert, K. Frank, R. Gohle, A. Maldonado, H. Meissner, A. Raman, and W. Rossteutscher, Naturwissenschaften **50**, 41 (1963).
- [140] M. E. Eanes, G. L. Schimek, and J. W. Kolis, Journal of chemical crystallography **30**, 223 (2000).
- [141] J. Li, H.-Y. Guo, X. Zhang, and M. G. Kanatzidis, Journal of alloys and compounds **218**, 1 (1995).
- [142] K. Zhang, H. Zhao, and Y. Zhou, Journal of the Less Common Metals **138**, 173 (1988).
- [143] N. Nasir, N. Melnychenko-Koblyuk, A. Grytsiv, P. Rogl, G. Giester, J. Wosik, and G. E. Nauer, Journal of Solid State Chemistry **183**, 565 (2010).
- [144] B. Eisenmann, N. May, W. Mueller, H. Schaefer, A. Weiss, J. Winter, and G. Ziegler, Zeitschrift fuer Naturforschung, Teil B. Anorganische Chemie, Organische Chemie (2,1947-32,1977) **25**, 1350 (1970).
- [145] N. May and H. Schaefer, Zeitschrift fuer Naturforschung, Teil B. Anorganische Chemie, Organische Chemie (2,1947-32,1977) **27**, 864 (1972).
- [146] W. Dörrscheidt, N. Niess, and H. Schäfer, Zeitschrift für Naturforschung B **31**, 890 (1976).
- [147] H. Kohlmann and C. Ritter, Zeitschrift für anorganische und allgemeine Chemie **635**, 1573 (2009).
- [148] J. Belošević-Čavor, V. Koteski, and J. Radaković, Solid State Communications **152**, 1072 (2012).
- [149] B. Kotur and G. Ratush, Inorganic materials **27**, 422 (1991).
- [150] H. Nowotny, O. Schob, and F. Benesovsky, Monatshefte für Chemie und verwandte Teile anderer Wissenschaften **92**, 1300 (1961).
- [151] J. Donaldson, A. Kjekshus, D. Nicholson, and T. Rakke, Journal of the Less Common Metals **41**, 255 (1975).
- [152] R. Nesper and F. Zürcher, Zeitschrift für Kristallographie-New Crystal Structures **214**, 19 (1999).
- [153] G. Bruzzone, E. Franceschi, and F. Merlo, Journal of the Less Common Metals **60**, 59 (1978).
- [154] S. Kabalkina, S. Popova, N. Serebryanaya, and L. Vereshchagin, in *Soviet Physics Doklady*, Vol. 8 (1964) p. 972.
- [155] S. Jaulmes, H. W. Shu, and A. Mazurier, Acta Crystallographica Section C **43**, 2268 (1987).
- [156] H. W. Shu, S. Jaulmes, and J. Flahaut, Journal of Solid State Chemistry **74**, 277 (1988).
- [157] S.-J. Kim and T. F. Fässler, Zeitschrift für Kristallographie-New Crystal Structures **223**, 325 (2008).
- [158] S. M. Young, S. Manni, J. Shao, P. C. Canfield, and A. N. Kolmogorov, Physical Review B **95**, 085116 (2017).
- [159] E. Makarov and K. Tobelko, in *Dokl. Akad. Nauk SSSR*, Vol. 275 (1984) pp. 91–93.
- [160] I. Grund, H.-U. Schuster, and P. Müller, Zeitschrift für anorganische und allgemeine Chemie **515**, 151 (1984).
- [161] M. Sedighi, B. A. Nia, H. Zarringhalam, and R. Moradian, The European Physical Journal-Applied Physics **61**, 10103 (2013).
- [162] X. Zhang, L. Jin, X. Dai, and G. Liu, The journal of physical chemistry letters **8**, 4814 (2017).
- [163] A. Agaev, K.A.and Talybov and S. Semiletov, Kristallografiya **11**, 736 (1966).
- [164] I. Silkin, Y. M. Koroteev, S. Eremeev, G. Bihlmayer, and E. V. Chulkov, JETP letters **94**, 217 (2011).
- [165] B. A. Kuropatwa and H. Kleinke, Zeitschrift für anorganische und allgemeine Chemie **638**, 2640 (2012).
- [166] A. Skripov, H. Wu, T. Udovic, Q. Huang, R. Hempelmann, A. Soloninin, A. Rempel, and A. Gusev, Journal of Alloys and Compounds **478**, 68 (2009).
- [167] F. Lissner and T. Schleid, Zeitschrift für Kristallographie-New Crystal Structures **216**, 351 (2001).
- [168] S. B. Hendricks and H. E. Merwin, American Journal of Science **15**, 487 (1928).
- [169] H. Boudierba, Y. Djaballah, A. Belgacem-Bouzida, and R. Beddiaf, Intermetallics **28**, 108 (2012).
- [170] H. Huang, J. Liu, D. Vanderbilt, and W. Duan, Physical Review B **93**, 201114 (2016).
- [171] S. Brutti, D. Nguyen-Manh, and D. Pettifor, Intermetallics **14**, 1472 (2006).
- [172] I. Petrov, R. Imamov, and Z. Pinsker, Sov Phys Crystallogr **13**, 339 (1968).
- [173] J. Evers, G. Oehlinger, and A. Weiss, Zeitschrift für Naturforschung B **34**, 524 (1979).
- [174] M. A. Pell, Y. V. Mironov, and J. A. Ibers, Acta Crystallographica Section C: Crystal Structure Communications **52**, 1331 (1996).
- [175] L. Yan, Z. Jian-Zhou, Y. Li, L. Cheng-Tian, L. Ai-Ji, H. Cheng, D. Ying, X. Yu, H. Shao-Long, Z. Lin, *et al.*, Chinese Physics Letters **32**, 067303 (2015).
- [176] G. Kliche, Journal of Solid State Chemistry **56**, 26 (1985).
- [177] M. Yan, H. Huang, K. Zhang, E. Wang, W. Yao, K. Deng, G. Wan, H. Zhang, M. Arita, H. Yang, *et al.*, Nature communications **8**, 257 (2017).
- [178] M. Stasova, Journal of Structural Chemistry **8**, 584 (1967).
- [179] K. Taketoshi and F. Andoh, Japanese journal of applied physics **34**, 3192 (1995).

- [180] D. J. Hinz, G. Meyer, T. Dedecke, and W. Urland, *Angewandte Chemie* **107**, 97 (1995).
- [181] M. Jehle, H. Scherer, M. Wendorff, and C. Roehr, *Journal of Solid State Chemistry* **182**, 1129 (2009).
- [182] C. Hadenfeldt and H. Herdejürgen, *Zeitschrift für Anorganische und Allgemeine Chemie* **558**, 35C40 (1988).
- [183] H. He, R. Stearrett, E. R. Nowak, and S. Bobev, *European Journal of Inorganic Chemistry* **2011**, 4025 (2011).
- [184] H. W. Shu, S. Jaulmes, and J. Flahaut, *Journal of Solid State Chemistry* **74**, 277 (1988).
- [185] D.-I. M. Asbrand, P. D. D. B. Eisenmann, and J. Klein, *Zeitschrift für Anorganische und Allgemeine Chemie* **621**, 576 (1995).
- [186] Q. Gibson, L. Schoop, L. Muechler, L. Xie, M. Hirschberger, N. Ong, R. Car, and R. Cava, *Physical Review B* **91**, 205128 (2015).
- [187] L. Shelimova, O. Karpinskii, M. Kretova, and G. Lubman, *INORGANIC MATERIALS* **29**, 56 (1993).
- [188] M. Neupane, S.-Y. Xu, L. A. Wray, A. Petersen, R. Shankar, N. Alidoust, C. Liu, A. Fedorov, H. Ji, J. M. Allred, *et al.*, *Physical Review B* **85**, 235406 (2012).
- [189] R. Chami, G. Brun, J. Tedenac, and M. Maurin, *Rev. Chim. Miner* **20**, 305 (1983).
- [190] J. A. Bland and S. J. Basinski, *Canadian Journal of Physics* **39**, 1040 (2011).
- [191] H. Zhang, X. He, W. Lin, R. Wei, F. Zhang, X. Du, G. Dong, and J. Qiu, *Optics Express* **23**, 13376 (2015).
- [192] C. P. Vicente, J. L. Tirado, K. Adouby, J. C. Jumas, A. A. Toure, and G. Kra, *Cheminform* **30**, no (2010).
- [193] H. Zhang, C. X. Liu, X. L. Qi, X. Dai, Z. Fang, and S. C. Zhang, *Nature Physics* **5**, 438 (2009).
- [194] O. G. Karpinskii, L. E. Shelimova, M. A. Kretova, E. S. Avilov, and V. S. Zemskov, *Inorganic Materials* **39**, 240 (2003).
- [195] O. Beckmann, H. Boller, and H. Nowotny, *Monatshefte für Chemie* **101**, 945 (1970).
- [196] J. P. Maehlen, V. A. Yartys, and B. C. Hauback, *Journal of Alloys and Compounds* **s 356C357**, 475 (2003).
- [197] Khaenko B.V. and Kukoli V.V., (1989).
- [198] H. Boudarba, Y. Djaballah, A. Belgacem-Bouzida, and R. Beddiaf, *Intermetallics* **28**, 108 (2012).
- [199] R. Nedumkandathil, D. E. Benson, J. Grins, K. Spektor, and U. Haeussermann, *Cheminform* **46** (2015).
- [200] H. Huang, J. Liu, D. Vanderbilt, and W. Duan, *Physical Review B* **93**, 201114 (2016).
- [201] D. Fenske and H. G. V. Schnering, *Angewandte Chemie* **95**, 420 (1983).
- [202] J. E. Davey and T. Pankey, *Applied Physics Letters* **12**, 38 (1968).
- [203] N. Serebryanaya, *Powder Diffraction* **7**, 99 (1992).
- [204] V. Khitrova, *Kristallografiya* **6**, 549 (1961).
- [205] K. Lejaeghere, V. V. Speybroeck, G. V. Oost, and S. Cottenier, *Critical Reviews in Solid State and Materials Sciences* **39**, 1 (2014).
- [206] R. Mazelsky and M. S. Lubell, *Journal of Physical Chemistry* **66** (2002).
- [207] H. Lin, R. Markiewicz, L. Wray, L. Fu, M. Hasan, and A. Bansil, *Physical review letters* **105**, 036404 (2010).
- [208] T. L. Anderson and H. B. Krause, *Acta Crystallographica* **30**, 1307C1310 (1974).
- [209] T. V. Menshchikova, S. Ereemeev, and E. V. Chulkov, *JETP letters* **94**, 106 (2011).
- [210] G. Concas, T. De Pascale, L. Garbato, F. Ledda, F. Meloni, A. Rucci, and M. Serra, *Journal of Physics and Chemistry of Solids* **53**, 791 (1992).
- [211] D. Niesner, S. Otto, V. Hermann, T. Fauster, T. Menshchikova, S. Ereemeev, Z. Aliev, I. Amiraslanov, M. Babanly, P. Echenique, *et al.*, *Physical Review B* **89**, 081404 (2014).
- [212] T. L. Anderson and H. B. Krause, *Acta Crystallographica* **30**, 1307C1310 (1974).
- [213] K. Kifune, Y. Kubota, T. Matsunaga, and N. Yamada, *Acta Crystallographica* **61**, 492 (2005).
- [214] R. Araujo and J. Corbett, *Inorganic Chemistry* **20**, 3082 (1981).
- [215] P. Ravindran, P. Vajeeston, R. Vidya, A. Kjekshus, and H. Fjellvåg, *Physical Review B* **64**, 224509 (2001).
- [216] E. Gladyshevskii, *Journal of Structural Chemistry* **5**, 523 (1964).
- [217] S. Brutti, D. Nguyen-Manh, and D. Pettifor, *Intermetallics* **14**, 1472 (2006).
- [218] E. Chebotareva and S. Nuzhdina, *Phys. Met. Metallogr.* **36**, 200 (1973).
- [219] Y.-U. Kwon and J. D. Corbett, *Journal of alloys and compounds* **190**, 219 (1993).
- [220] C. Rawn, M. Barsoum, T. El-Raghy, A. Prociopio, C. Hoffmann, and C. Hubbard, *Materials research bulletin* **35**, 1785 (2000).
- [221] A. Dwight, *Trans. ASM* **53**, 479 (1961).
- [222] J. Etzkorn, M. Ade, and H. Hillebrecht, *Inorganic chemistry* **46**, 1410 (2007).
- [223] C. Hadenfeldt and H. Herdejürgen, *Zeitschrift für anorganische und allgemeine Chemie* **558**, 35 (1988).
- [224] W. Witteman, A. Giorgi, and D. Vier, *The Journal of Physical Chemistry* **64**, 434 (1960).
- [225] S. Brutti, D. Nguyen-Manh, and D. Pettifor, *Journal of Alloys and Compounds* **457**, 29 (2008).
- [226] R. Umamaheswari, M. Yogeswari, and G. Kalpana, *Solid State Communications* **155**, 62 (2013).
- [227] T. Schleid, P. Lauxmann, and C. Schneck, *Z Kristallogr* **16**, 95 (1999).
- [228] S. Saib and N. Bouarissa, *Physica B: Condensed Matter* **387**, 377 (2007).
- [229] M. Schowalter, A. Rosenauer, and K. Volz, *Acta Crystallographica Section A: Foundations of Crystallography* **68**, 319 (2012).
- [230] J. Schuster and J. Bauer, *Journal of the Less Common Metals* **109**, 345 (1985).
- [231] R. Wang, S. Wang, X. Wu, and Y. Yao, *Solid State Communications* **151**, 996 (2011).
- [232] C.-H. Chen, T. Aizawa, N. Iyi, A. Sato, and S. Otani, *Journal of Alloys and Compounds* **366**, L6 (2004).
- [233] L. Tanner and R. Ray, *Acta Metallurgica* **27**, 1727 (1979).
- [234] U. Schwarz, H. Hillebrecht, M. Kaupp, K. Syassen, H.-G. von Schnering, and G. Thiele, *Journal of solid state chemistry* **118**, 20 (1995).

- [235] M. Sakata, T. Nishiwaki, and J. Harada, *Journal of the Physical Society of Japan* **47**, 232 (1979).
- [236] K. Yamada, S. Funabiki, H. Horimoto, T. Matsui, T. Okuda, and S. Ichiba, *Chemistry Letters* **20**, 801 (1991).
- [237] T. Chattopadhyay, H. Von Schnering, W. Grosshans, and W. Holzapfel, *Physica B+ C* **139**, 356 (1986).
- [238] D. Killpatrick, *Journal of Physics and Chemistry of Solids* **25**, 1213 (1964).
- [239] Y. F. Lomnytska and V. Berezovets, *Inorganic materials* **41**, 1166 (2005).
- [240] S. Furuseth, K. Selte, A. Kjekshus, S. Gronowitz, R. Hoffman, and A. Westerdahl, *Acta Chem. Scand* **19**, 42 (1965).
- [241] M. Kim, C.-Z. Wang, and K.-M. Ho, arXiv preprint arXiv:1807.03405 (2018).
- [242] K. Yoshihara, J. Taylor, L. Calvert, and J. Despault, *Journal of the Less Common Metals* **41**, 329 (1975).
- [243] Z. Lv, H. Hu, C. Wu, S. Cui, G. Zhang, and W. Feng, *Physica B: Condensed Matter* **406**, 2750 (2011).
- [244] Y. Imai and A. Watanabe, *Journal of Alloys and Compounds* **509**, 7877 (2011).
- [245] M. S. Suleiman and D. P. Joubert, arXiv preprint arXiv:1310.2751 (2013).
- [246] M. Abdusalyamova, O. Rakhmatov, and K. Shokirov, *Russian Metallurgy* **1988**, 183 (1988).
- [247] M. Zeng, C. Fang, C. G., Y.-A. Chen, T. Hsieh, A. Bansil, H. Lin, and L. Fu, arXiv: 1504.03492 (2015).
- [248] A. Iandelli, *Atti della Accademia Nazionale dei Lincei, Classe di Scienze Fisiche, Matematiche e Naturali, Rendiconti, Serie 8 (1, 1946-)* **37**, 160 (1964).
- [249] G. Ugur, S. Ugur, A. Erkisi, and F. Soyalp, *Int. J. Mod. Phys.* **22**, 5027 (2008).
- [250] M. Abdusalyamova, H. Shokirov, and O. Rakhmatov, *Journal of the Less-Common Metals* **166**, 221 (1990).
- [251] H. Goretzki, *physica status solidi (b)* **20**, K141 (1967).
- [252] S. Semiletov, *Kristallografiya* **4**, 629 (1959).
- [253] H. J. Deiseroth, A. Strunck, and W. Bauhofer, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **575**, 31C38 (1989).
- [254] B. Eisenmann, C. Gieck, and U. Roessler, *Zeitschrift fuer Kristallographie - New Crystal Structures* **216**, 36 (2001).
- [255] B. Brown, *Acta Crystallographica* **20**, 268 (1966).
- [256] K. Deller and B. Eisenmann, *Cheminform* **7**, 1146 (1976).
- [257] S. Kikkawa, N. Ogawa, M. Koizumi, and Y. Onuki, *Journal of Solid State Chemistry* **41**, 315 (1982).
- [258] G. Kumagai, T. Matsuura, K. Ichimura, K. Yamaya, K. Inagaki, and S. Tanda, *Physical Review B* **81**, 184506 (2010).
- [259] J. Kleppinger, J. Wrazel, J. Calabrese, and E. Larsen, *Inorganic Chemistry* **19**, 3172 (1980).
- [260] M. Somer, W. Carrillo Cabrera, K. Peters, and H. von Schnering, *Zeitschrift fuer Kristallographie - New Crystal Structures* **213**, 683 (1998).
- [261] W. Bensch and W. Heid, *Acta Crystallographica, Section C: Crystal Structure Communications* **51**, 2205 (1995).
- [262] Y.-Y. Wang, Q.-H. Yu, P.-J. Guo, K. Liu, and T.-L. Xia, *Physical Review B* **94**, 041103 (2016).
- [263] R. G. Ling and C. Belin, **292**, 891 (1981).
- [264] L. H. Dietrich and W. Jeitschko, *Journal of Solid State Chemistry* **63**, 377 (1986).
- [265] P. Jensen, A. Kjekshus, T. Skansen, J. Brunvoll, and M. Hinton, *Acta Chemica Scandinavica* **19**, 1499 (1965).
- [266] J. Wang, S. Q. Xia, and X. T. Tao, *Cheminform* **44**, 6 (2013).
- [267] B. Saparov, S. Q. Xia, and S. Bobev, *Inorganic Chemistry* **47**, 11237 (2008).
- [268] V. B. Heike, S. Arndt, and B. Wolfgang, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **438**, 53C67 (1978).
- [269] O. Levy, G. L. W. Hart, and S. Curtarolo, *Acta Materialia* **58**, 2887 (2010).
- [270] S. V. Savilov, V. N. Khrustalev, A. N. Kuznetsov, B. A. Popovkin, and M. Y. Antipin, *Russian Chemical Bulletin* **54**, 87 (2005).
- [271] P. Tang, B. Yan, W. Cao, S.-C. Wu, C. Felser, and W. Duan, *Physical Review B* **89**, 041409 (2014).
- [272] E. Todorov and S. C. Sevov, *Angewandte Chemie International Edition* **38**, 1775 (1999).
- [273] D. G. Adolphson and J. D. Corbett, *Chemischer Informationsdienst* **7**, 1820 (1976).
- [274] S. J. Hwu, D. S. Dudis, and J. D. Corbett, *Inorganic Chemistry* **26**, 469 (1987).
- [275] F. Hulliger, *Nature* **204**, 775 (1964).
- [276] S. Furuseth and A. Kjekshus, *Acta Chemica Scandinavica (1-27,1973-42,1988)* **18**, 1180 (1964).
- [277] F. Hulliger, *Nature* **204**, 775 (1964).
- [278] Y. Li, L. Li, J. Wang, T. Wang, X. Xu, C. Xi, C. Cao, and J. Dai, *Physical Review B* **94**, 121115 (2016).
- [279] A. Hayashi, Y. Ueda, K. Kosuge, H. Murata, H. Asano, N. Watanabe, and F. Izumi, *Journal of Solid State Chemistry* **67**, 346 (1987).
- [280] M. Conrad and B. Harbrecht, *Journal of Alloys and Compounds* **187**, 181 (1992).
- [281] V. Larchev and S. Popova, *Journal of the Less-Common Metals* **87-91**, 50 (1982).
- [282] S. Ibragimova, F. Aliev, O. Aliev, V. Mamedov, and Z. Ibragimov, *Russian Journal of Inorganic Chemistry* **39**, 194 (1994).
- [283] R. Ceolin, N. Rodier, and P. Khodadad, *Journal of the Less-Common Metals* **53**, 137 (1977).
- [284] T. Chattopadhyay, K. Khalaff, and K. Schubert, *Metallofizika* **28**, 1160 (1974).
- [285] G. Cordier, H. Schaefer, and M. Stelter, *Zeitschrift fuer Naturforschung, Teil B. Anorganische Chemie, Organische Chemie (33,1978-41,1986)* **40**, 5 (1985).
- [286] D. Schmitz and W. Bronger, *Zeitschrift für Naturforschung B* **29**, 438 (1974).
- [287] B. Altintas, *Journal of Theoretical and Computational Chemistry* **10**, 65 (2011).
- [288] G. Bruzzone and F. Merlo, *Journal of the Less Common Metals* **35**, 153 (1974).
- [289] E. DiMasi, B. Foran, M. Aronson, and S. Lee, *Physical Review, Serie 3. B - Condensed Matter (18,1978-)* **54**, 13587 (1996).
- [290] W. Rieger and E. Parthé, *Acta Crystallographica* **22**, 919 (1967).

- [291] A. Kitano, K. Moriguchi, M. Yonemura, S. Munetoh, A. Shintani, H. Fukuoka, S. Yamanaka, E. Nishibori, M. Takata, and M. Sakata, *Physical Review B* **64**, 045206 (2001).
- [292] W. Rieger and E. Parthé, *Acta Crystallographica* **22**, 919 (1967).
- [293] G. Bruzzone and E. Franceschi, *Journal of the Less-Common Metals* **52**, 211 (1977).
- [294] M. T. Klem, J. Vaughey, J. G. Harp, and J. D. Corbett, *Inorganic chemistry* **40**, 7020 (2001).
- [295] M. Bailey and F. DiSalvo, *Journal of Alloys and Compounds* **353**, 146 (2003).
- [296] B. Saparov and S. Bobev, *Dalton Transactions* **39**, 11335 (2010).
- [297] F. Merlo and M. Fornasini, *Journal of the Less Common Metals* **119**, 45 (1986).
- [298] E. A. Leon-Escamilla and J. D. Corbett, *Inorganic chemistry* **40**, 1226 (2001).
- [299] B. Saparov and S. Bobev, *Dalton Transactions* **39**, 11335 (2010).
- [300] F. Merlo and M. Fornasini, *Journal of the Less Common Metals* **13**, 603 (1967).
- [301] A. Widera and H. Schäfer, *Journal of the Less Common Metals* **77**, 29 (1981).
- [302] J. Zhao and E. Parthe, *Acta Crystallographica, Section C: Crystal Structure Communications* **46**, 2276 (1990).
- [303] T. Langer, S. Dupke, H. Eckert, S. Matar, M. Winter, and R. Poettgen, *Solid State Sciences* **14**, 367 (2012).
- [304] G. Shengping, Y. Taesoo, and S. Bobev, *Inorganic Chemistry* **51**, 367 (3119).
- [305] G. Cordier, *Zeitschrift für Naturforschung B* **43**, 1253 (1988).
- [306] R. Rousseau, K. Uehara, D. D. Klug, and J. S. Tse, *ChemPhysChem* **6**, 1703 (2005).
- [307] Q. Xie, E. Cuervo Reyes, M. Wörle, and R. Nesper, *Zeitschrift für anorganische und allgemeine Chemie* **637**, 846 (2011).
- [308] M. C. Schäfer, N.-T. Suen, and S. Bobev, *Dalton Transactions* **43**, 16889 (2014).
- [309] P. Pietrokowsky, *Journal of the Institute of Metals* **90**, 434 (1962).
- [310] W. Yi, Y. Matsushita, M. Tanaka, and A. A. Belik, *Inorganic chemistry* **51**, 7650 (2012).
- [311] H. He, C. Tyson, and S. Bobev, *Inorganic chemistry* **50**, 8375 (2011).
- [312] K. Schubert, H. Breimer, W. Burkhardt, E. Günzel, R. Hauffer, H. Lukas, H. Vetter, J. Wegst, and M. Wilkens, *Naturwissenschaften* **44**, 229 (1957).
- [313] V. Johnson and W. Jeitschko, *Journal of Solid State Chemistry* **6**, 306 (1973).
- [314] H. Onken, K. Vierheilg, and H. Hahn, *Zeitschrift für anorganische und allgemeine Chemie* **333**, 267 (1964).
- [315] Q. Xu, Z. Song, S. Nie, H. Weng, Z. Fang, and X. Dai, *Physical Review B* **92**, 205310 (2015).
- [316] V. Johnson and W. Jeitschko, *Journal of Solid State Chemistry* **6**, 306 (1973).
- [317] A. Klein Haneveld and F. Jellinek, *Recueil des Travaux Chimiques des Pays-Bas* **83**, 776 (1964).
- [318] A. Klein Haneveld and F. Jellinek, *Recueil des Travaux Chimiques des Pays-Bas* **83**, 776 (1964).
- [319] V. Smetana, V. Babizhetskyy, G. V. Vajenine, and A. Simon, *Journal of Solid State Chemistry* **180**, 1889 (2007).
- [320] W. Pearson, *Zeitschrift für Kristallographie-Crystalline Materials* **171**, 23 (1985).
- [321] A. Hütz, *Z. Metallkd* **65**, 618 (1974).
- [322] M. Martinez-Ripoll, A. Haase, and G. Brauer, *Acta Crystallographica Section B: Structural Crystallography and Crystal Chemistry* **30**, 2003 (1974).
- [323] B. EISENMANN and K. DELLER, *ZEITSCHRIFT FÜR NATURFORSCHUNG SECTION BA JOURNAL OF CHEMICAL SCIENCES* **30**, 66 (1975).
- [324] T. Yajima, K. Nakano, F. Takeiri, J. Hester, T. Yamamoto, Y. Kobayashi, N. Tsuji, J. Kim, A. Fujiwara, and H. Kageyama, *Journal of the Physical Society of Japan* **82**, 013703 (2012).
- [325] H. Putz, J. Schön, and M. Jansen, *Zeitschrift für anorganische und allgemeine Chemie* **625**, 1624 (1999).
- [326] M. Martinez-Ripoll, A. Haase, and G. Brauer, *Acta Crystallographica Section B* **29**, 1715 (1973).
- [327] O. Degtyareva, M. I. McMahon, and R. J. Nelmes, *High Pressure Research* **15**, 143 (1996).
- [328] M. Ellner and B. Predel, *Zeitschrift fuer Metallkunde* **51**, 327 (1960).
- [329] P. Gougeon, O. Pena, M. Potel, M. Sergent, and R. Brusetti, *Annales de Chimie (Paris) (Vol=Year)* **9**, 1079 (1984).
- [330] J. Evers, G. Oehlinger, and A. Weiss, *Angewandte Chemie* **89**, 673 (1977).
- [331] K. Yamana, K. Kihara, and T. Matsumoto, *Acta Crystallographica* **35**, 147 (2010).
- [332] I. Petrov and R. Imamov, *Kristallografiya* **14**, 699 (1969).
- [333] I. Silkin, Y. M. Koroteev, S. Ereemeev, G. Bihlmayer, and E. V. Chulkov, *JETP letters* **94**, 217 (2011).
- [334] M. M. Stasova, *Journal of Structural Chemistry* **8**, 584 (1967).
- [335] K. Yamana, K. Kihara, and T. Matsumoto, *Acta Crystallographica* **35**, 147 (2010).
- [336] T. Matkovic and P. Matkovic, *Metalurgija, Croatia* **31**, 107 (1992).
- [337] C. Wang, C. Eylem, and T. Hughbanks, *Inorganic Chemistry* **37**, 390 (1998).
- [338] H. He, C. Tyson, and S. Bobev, *Cheminform* **42**, 8375 (2011).
- [339] S. Geller and J. H. Wernick, *Acta Crystallographica* **12**, 46C54 (1959).
- [340] B. Gardes, G. Brun, and J.-C. Tedenac, *European journal of solid state and inorganic chemistry* **26**, 221 (1989).
- [341] Q. Gibson, L. Schoop, A. Weber, H. Ji, S. Nadj-Perge, I. Drozdov, H. Beidenkopf, J. Sadowski, A. Fedorov, A. Yazdani, *et al.*, *Physical Review B* **88**, 081108 (2013).
- [342] R. Imamov and S. Semiletov, *Sov Phys Crystallogr* **15**, 845 (1971).
- [343] R. L. Daake and J. D. Corbett, *Chemischer Informationsdienst* **8**, 2029 (1977).
- [344] K. Sakamaki, H. Wada, H. Nozaki, Y. nuki, and M. Kawai, *Journal of Alloys and Compounds* **339**, 283 (2002).
- [345] B. Eisenmann and M. Somer, *Zeitschrift Fr Naturforschung B* **44**, 1228 (1989).
- [346] Hadenfeldt, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **436**, 113 (1977).
- [347] H. Mattausch, A. Simon, N. Holzer, and R. Eger, *Zeitschrift fuer Anorganische und Allgemeine Chemie (1950) (DE)* **466**, 7 (1980).

- [348] J. Yang and F. Gao, *physica status solidi (b)* **247**, 2161 (2010).
- [349] C. Sunandana, K. Chandrasekaran, G. Aravamudan, and G. S. Rao, *Journal of the Less Common Metals* **84**, 115 (1982).
- [350] Y. Du, X. Bo, D. Wang, E.-J. Kan, C.-G. Duan, S. Y. Savrasov, and X. Wan, *Physical Review B* **96**, 235152 (2017).
- [351] E. Zhao, J. Wang, J. Meng, and Z. Wu, *Computational Materials Science* **47**, 1064 (2010).
- [352] A. Iandelli, *ChemInform* **18**, 28 (1987).
- [353] A. Mewis, *Zeitschrift für Naturforschung B* **34**, 14 (1979).
- [354] A. Czybulka, G. Steinberg, and H.-U. Schuster, *Zeitschrift für Naturforschung B* **34**, 1057 (1979).
- [355] D. Johrendt and A. Mewis, *Journal of Alloys and Compounds* **183**, 210 (1992).
- [356] J. T. Norton, H. Blumenthal, and S. J. Sindeband, *JOM* **1**, 749 (1949).
- [357] Y.-U. Kwon and J. D. Corbett, *Journal of alloys and compounds* **190**, 219 (1993).
- [358] R. Vogel and H. Schuster, *Zeitschrift fuer Naturforschung, Teil B. Anorganische Chemie, Organische Chemie (33,1978-41,1986)* **35**, 114 (1980).
- [359] H.-J. Zhang, S. Chadov, L. Muehler, B. Yan, X.-L. Qi, J. Kübler, S.-C. Zhang, and C. Felser, *Physical review letters* **106**, 156402 (2011).
- [360] K. G. Strid, N. G. Vannerberg, J. Sletten, E. Kulonen, J. Brunvoll, E. Bunnenberg, C. Djerassi, and R. Records, *Acta Chemica Scandinavica* **20**, 1064 (1966).
- [361] R. Matthes and H. U. Schuster, *Zeitschrift Fr Naturforschung B* **35**, 778 (1980).
- [362] C. Tomuschat and H. U. Schuster, *Zeitschrift Fr Naturforschung B* **36**, 1193 (1981).
- [363] H. Vincent, C. Vincent, B. F. Mentzen, S. Pastor, and J. Bouix, *Materials Science and Engineering A* **256**, 83C91 (1998).
- [364] H. Boudarba, Y. Djaballah, A. Belgacem-Bouzida, and R. Beddiaf, *Physica B Condensed Matter* **406**, 2601 (2011).
- [365] T. H. Hsieh, J. Liu, and L. Fu, *Physical Review B* **90**, 081112 (2014).
- [366] A. Palenzona and P. Manfrinetti, *Journal of the Less Common Metals* **85**, 307 (1982).
- [367] A. Widera and H. Schaefer, *Materials Research Bulletin* **15**, 1805 (1980).
- [368] W. Jeitschko, H. Nowotny, and F. Benesovsky, *Monatshefte fuer Chemie* **95**, 436 (1964).
- [369] Y. Cherchab, B. Amrani, N. Sekkal, M. Ghezali, and K. Talbi, *Physica E, Elsevier B.V.* **40**, 606 (2008).
- [370] H. Nowotny, K. Schubert, and U. Dettinger, **37**, 137 (1946).
- [371] W. Zhou, L. Liu, B. Li, P. Wu, and Q. Song, *Computational Materials Science* **46**, 921 (2009).
- [372] B. Saparov, J. E. Mitchell, and A. S. Sefat, *Superconductor Science and Technology* **25**, 084016 (2012).
- [373] A. Dwight and C. Kimball, *Journal of the Less Common Metals* **127**, 179 (1987).
- [374] M. Besnus, J. Kappler, M. Ravet, A. Meyer, R. Lahiouel, J. Pierre, E. Slaud, G. Nieva, and J. Sereni, *Journal of the Less Common Metals* **120**, 101 (1986).
- [375] C. Batalli-Cosmovici, *Zeitschrift für Naturforschung A* **24**, 677 (1969).
- [376] X.-X. Sun, Z.-R. Ren, and D.-G. Wang, *Modern Physics Letters B* **26**, 1250217 (2012).
- [377] A. Kapustin, *Kristallografiya* **7**, 243 (1962).
- [378] A. Zaoui and M. Ferhat, *Solid State Communications* **151**, 867 (2011).
- [379] A. Mariano and K. Chopra, *Applied Physics Letters* **10**, 282 (1967).
- [380] B. Rakshit, S. P. Sanyal, and M. Celino, *Solid State Communications* **149**, 1326 (2009).
- [381] A. Mariano and K. Chopra, *Applied Physics Letters* **10**, 282 (1967).
- [382] P. Bauer Pereira, I. Sergueev, S. Gorsse, J. Dadda, E. Müller, and R. P. Hermann, *physica status solidi (b)* **250**, 1300 (2013).
- [383] T. H. Hsieh, H. Lin, J. Liu, W. Duan, A. Bansil, and L. Fu, *Nature communications* **3**, 982 (2012).
- [384] M. Abdusalyamova, H. Shokirov, and O. Rakhmatov, *Journal of the Less-Common Metals* **166**, 221 (1990).
- [385] P. Lightfoot, F. Krok, J. L. Nowinski, and P. G. Bruce, *Journal of Materials Chemistry* **2**, 139 (1992).
- [386] H. Zhang, C.-X. Liu, X.-L. Qi, X. Dai, Z. Fang, and S.-C. Zhang, *Nature Physics* **5**, 438 (2009).
- [387] Y. Xia, D. Qian, D. Hsieh, L. Wray, A. Pal, H. Lin, A. Bansil, D. Grauer, Y. S. Hor, R. J. Cava, and M. Z. Hasan, *Nature Physics* **5**, 398 (2009).
- [388] D. O. Scanlon, P. D. C. King, R. P. Singh, A. d. l. Torre, S. M. Walker, G. Balakrishnan, F. Baumberger, and C. R. A. Catlow, *Adv. Mater.* **24**, 2154 (2012).
- [389] T. H. Hsieh, H. Lin, J. Liu, W. Duan, A. Bansil, and L. Fu, *Nat. Commun.* **3**, 982 (2012).
- [390] N. Wang, D. West, J. Liu, J. Li, Q. Yan, B.-L. Gu, S. B. Zhang, and W. Duan, *Phys. Rev. B* **89**, 045142 (2014).
- [391] J. Beck and T. Schlorb, *Z. Kristallogr* **214**, 780 (1999).
- [392] Z. Zvonkova and G. Zhdanov, *Zhurnal Fizicheskoi Khimii* **26**, 586 (1952).
- [393] W. Mueller, *Zeitschrift fuer Naturforschung, Teil B. Anorganische Chemie, Organische Chemie (2,1947-32,1977)* **29**, 304 (1974).
- [394] C.-S. Lee, A. Safa-Sefat, J. Greedan, and H. Kleinke, *Chemistry of materials* **15**, 780 (2003).
- [395] N. Gerlitzki and G. Meyer, *Zeitschrift fuer Anorganische und Allgemeine Chemie (1950) (DE)* **628**, 915 (2002).
- [396] L. Chang and T. Read, *JOM* **3**, 47 (1951).
- [397] H. Doonkersloot and V. Vucht, *Journal of Less-Common Metals* **20**, 83 (1970).
- [398] S. Deibele and M. Jansen, *Journal of Solid State Chemistry* **147**, 117 (1999).
- [399] F. Merlo and M. Fornasini, *Materials research bulletin* **29**, 149 (1994).
- [400] K. Schubert, H. Lukas, H. Meissner, and S. Bhan, *Zeitschrift fur Metallkunde* **50**, 534 (1959).
- [401] M. Sauer, A. Engel, and H. Lueken, *ChemInform* **183**, 281 (1992).
- [402] S.-J. Hwu and J. D. Corbett, *Journal of Solid State Chemistry* **64**, 331 (1986).

- [403] E. Brechtel, G. Cordier, and H. Schäfer, *Zeitschrift für Naturforschung B* **36**, 1099 (1981).
- [404] E. Brechtel, G. Cordier, and H. Schäfer, *Zeitschrift für Naturforschung B* **34**, 1229 (1979).
- [405] O. Aliev, *Inorganic Mater.* **16**, 1027 (1981).
- [406] G. Cordier and T. Friedrich, *Zeitschrift für Kristallographie-Crystalline Materials* **205**, 135 (1993).
- [407] B. Eisenmann and M. Asbrand, *Zeitschrift für Kristallographie-Crystalline Materials* **198**, 283 (1992).
- [408] H. Guerrero, R. Cappelletti, D. Neumann, and T. Yildirim, *Chemical physics letters* **297**, 265 (1998).
- [409] E. Rönnebro, J. Yin, A. Kitano, M. Wada, and T. Sakai, *Solid State Ionics* **176**, 2749 (2005).
- [410] J. Omaly, P. Batail, D. Grandjean, D. Avignant, and J.-C. Cousseins, *Acta Crystallographica Section B* **32**, 2106 (1976).
- [411] D. Colaitis, C. Lecaille, and D. Lebas, *Revue de Chimie Minerale* **9**, 709 (1972).
- [412] P. Fischer, D. Schwarzenbach, and H. Rietveld, *Journal of Physics and Chemistry of Solids* **32**, 543 (1971).
- [413] Z. Mazej, E. Goreshnik, and G. Tavčar, *Journal of Fluorine Chemistry* **132**, 686 (2011).
- [414] D. Kurzydowski, Z. Mazej, Z. Jagličić, Y. Filinchuk, and W. Grochala, *Chemical Communications* **49**, 6262 (2013).
- [415] M. Sauer, A. Engel, and H. Lueken, *Journal of Alloys and Compounds* **183**, 281 (1992).
- [416] W. M. Hurng and J. D. Corbett, *Chemistry of Materials* **1**, 311 (1989).
- [417] G. Bruzzone, E. Franceschi, and F. Merlo, *Journal of the Less-Common Metals* **60**, 59 (1978).
- [418] W. M. Hurng and J. D. Corbett, *Chemistry of Materials* **1**, 311 (1989).
- [419] J. Li and P. J. Carroll, *Materials research bulletin* **27**, 1073 (1992).
- [420] J. Jorda, M. Ishikawa, and E. Hovestreydt, *Journal of the Less Common Metals* **92**, 155 (1983).
- [421] C. Jiang, Z. Lin, and Y. Zhao, *Scripta Materialia* **63**, 532 (2010).
- [422] J. Li, M. E. Badding, and F. DiSalvo, *Journal of alloys and compounds* **184**, 257 (1992).
- [423] A. Heerdmann, D. Johrendt, and A. Mewis, *Zeitschrift für anorganische und allgemeine Chemie* **626**, 1393 (2000).
- [424] O. McMasters, K. Gschneider, G. Bruzzone, and A. Palenzona, *Journal of the Less-Common Metals* **25**, 135 (1971).
- [425] R. Troc, R. Wawryk, and A. Gribanov, *Journal of Alloys and Compounds* **581**, 659 (2013).
- [426] J. Jorda, M. Ishikawa, and E. Hovestreydt, *Journal of the Less-Common Metals* **92**, 155 (1983).
- [427] J. Moreau, J. le Roy, and D. Paccard, *Acta Crystallographica B* (24,1968-38,1982) **38**, 2446 (1982).
- [428] U. Rodewald, B. Heying, R. Hoffmann, D. Niepmann, and R. Poettgen, *Zeitschrift fuer Naturforschung, B: Chemical Sciences* **64**, 383 (2009).
- [429] J. Moreau, J. le Roy, and D. Paccard, *Acta Crystallographica B* (24,1968-38,1982) **38**, 2446 (1982).
- [430] W. Harms, V. Mihajlov, M. Wendorff, and C. Roehr, *ChemInform* **41**, 1127 (2010).
- [431] F. Merlo, *Journal of the Less Common Metals* **86**, 241 (1982).
- [432] M. Bostrom, Y. Prots, and Y. Grin, *Zeitschrift für Kristallographie-New Crystal Structures* **219**, 3 (2004).
- [433] S. Seidel, R.-D. Hoffmann, and R. Poettgen, *Zeitschrift für Kristallographie-Crystalline Materials* **229**, 421 (2014).
- [434] M. Poetzschke and K. Schubert, *Zeitschrift fuer Metallkunde* **53**, 474 (1962).
- [435] R. Andrusyak and B. Kotur, *Russian Metallurgy(USA)* **1991**, 204 (1991).
- [436] F. Schmidt, O. McMasters, and O. Carlson, *Journal of the Less Common Metals* **26**, 53 (1972).
- [437] M. G. Haase, H. Block, and W. Jeitschko, *Zeitschrift für anorganische und allgemeine Chemie* **627**, 1941 (2001).
- [438] R. V. Panin, N. R. Khasanova, A. M. Abakumov, E. V. Antipov, G. Van Tendeloo, and W. Schnelle, *Journal of Solid State Chemistry* **180**, 1566 (2007).
- [439] H. Zentgraf, K. Claes, and R. Hoppe, *Zeitschrift fuer Anorganische und Allgemeine Chemie (1950) (DE)* **462**, 92 (1980).
- [440] H. G. von Schnering, M. Hartweg, U. Hartweg, and W. Hönle, *Angewandte Chemie* **101**, 98 (1989).
- [441] S. Li, Z.-M. Yu, Y. Liu, S. Guan, S.-S. Wang, X. Zhang, Y. Yao, and S. A. Yang, *Physical Review B* **96**, 081106 (2017).
- [442] S. Clarke and F. DiSalvo, *Journal of Solid State Chemistry* **132**, 394 (1997).
- [443] K. Gschneidner Jr, Y. Mudryk, A. Becker, and J. Larson, *Calphad* **33**, 8 (2009).
- [444] T. Button, I. McColm, and J. Ward, *Journal of the Less Common Metals* **159**, 205 (1990).
- [445] D. Li, G. Luo, Z. Xiao, and J. Dai, *Science China Chemistry* **55**, 131 (2012).
- [446] P. Tobash and S. Bobev, *Journal of Alloys and Compounds* **418**, 58 (2006).
- [447] C. Wilkinson, *Acta Crystallographica (1,1948-23,1967)* **22**, 924 (1967).
- [448] S. E. McLain, M. R. Dolgos, D. A. Tennant, J. F. Turner, T. Barnes, T. Proffen, B. C. Sales, and R. I. Bewley, *Nature materials* **5**, 561 (2006).
- [449] Q. Lin and J. D. Corbett, *Inorganic chemistry* **46**, 8722 (2007).
- [450] W. Chaimayo, L. F. Lundegaard, I. Loa, G. W. Stinton, A. R. Lennie, and M. I. McMahon, *High Pressure Research* **32**, 442 (2012).
- [451] Z. Liu, C.-X. Liu, Y.-S. Wu, W.-H. Duan, F. Liu, and J. Wu, *Physical Review Letters* **107**, 136805 (2011).
- [452] R. Wang and H. Steinfink, *Inorganic Chemistry* **6**, 1685 (1967).
- [453] R. Poettgen and W. Jeitschko, *Zeitschrift fuer Naturforschung, B: Chemical Sciences* **47**, 358 (1992).
- [454] S. Guo, T.-S. You, Y.-H. Jung, and S. Bobev, *Inorganic Chemistry* **51**, 6821 (2012).
- [455] T. Siegrist, F. Hulliger, and G. Travaglini, *Journal of the Less-Common Metals* **92**, 119 (1983).
- [456] A. Iandelli and A. Palenzona, *Journal of the Less-Common Metals* **15**, 273 (1968).
- [457] O. McMasters and K. Gschneidner, *Journal of the Less-Common Metals* **38**, 137 (1974).
- [458] V. Smetana and A. Simon, *Zeitschrift für Naturforschung B* **65**, 643 (2010).
- [459] E. Y. Zakharova, A. V. Churakov, T. Doert, and A. N. Kuznetsov, *European Journal of Inorganic Chemistry* **2013**, 6164 (2013).
- [460] S. Panda and S. Bhan, *Zeitschrift fuer Metallkunde* **64**, 793 (1973).
- [461] R. Phal Ram and S. Bhan, *Zeitschrift fuer Metallkunde* **69**, 524 (1978).

- [462] K.-J. Range and E. G. Christl, *Journal of the Less Common Metals* **136**, 277 (1988).
- [463] H. Seifert, *Zeitschrift für Kristallographie-Crystalline Materials* **104**, 385 (1942).
- [464] P. Matković, W. Wopersnow, and K. Schubert, *Journal of the Less Common Metals* **56**, 69 (1977).
- [465] G. Kraemer and M. Jansen, *Journal of Solid State Chemistry* **114**, 206 (1995).
- [466] M. El-Boragy and K. Schubert, *Z. Metallkd* **61**, 579 (1970).
- [467] E. Y. Zakharova, N. A. Andreeva, S. M. Kazakov, and A. N. Kuznetsov, *Journal of Alloys and Compounds* **621**, 307 (2015).
- [468] M. El-Boragy and K. Schubert, *Z. Metallkd* **61**, 579 (1970).
- [469] V. Anand, H. Kim, M. Tanatar, R. Prozorov, and D. Johnston, *Physical Review B* **87**, 224510 (2013).
- [470] A. Mewis, *Zeitschrift für Naturforschung B* **39**, 713 (1984).
- [471] G. Bruzzone and F. Merlo, *Journal of the Less Common Metals* **48**, 103 (1976).
- [472] J. Neumann, A. Mikula, and Y. Chang, *Metallurgical Transactions A* **13**, 1123 (1982).
- [473] M. El-Boragy and K. Schubert, *Z. Metallkd* **61**, 579 (1970).
- [474] H. Nowotny, E. Bauer, A. Stempfl, and H. Bittner, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **83**, 221 (1952).
- [475] B. Dayal *et al.*, *Acta Crystallographica Section B: Structural Crystallography and Crystal Chemistry* **25**, 1010 (1969).
- [476] A. Arakcheeva, V. Grinevich, V. Shamrai, M. Meyer, and G. Chapuis, *Crystallography Reports* **44**, 2 (1999).
- [477] H. Bittner and H. Nowotny, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **83**, 287 (1952).
- [478] F. Laufek, A. Vymazalová, M. Drábek, J. Navrátil, T. Plecháček, and J. Drahokoupil, *Solid State Sciences* **14**, 1476 (2012).
- [479] E. Bauer, H. Nowotny, and A. Stempfl, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **84**, 692 (1953).
- [480] M. El-Boragy and K. Schubert, *Z. Metallkd* **61**, 579 (1970).
- [481] X.-Q. Chen, C. L. Fu, and J. R. Morris, *Intermetallics* **18**, 998 (2010).
- [482] M. El-Boragy and K. Schubert, *Z. Metallkd* **61**, 579 (1970).
- [483] S. Brutti, D. Nguyen-Manh, and D. Pettifor, *Journal of Alloys and Compounds* **457**, 29 (2008).
- [484] M. McMahon, T. Bovornratanaraks, D. Allan, S. Belmonte, and R. Nelmes, *Physical Review B* **61**, 3135 (2000).
- [485] Z. Meiguang, Y. Haiyan, Z. Gangtai, W. Qun, and W. Hui, *Solid State Communications* **152**, 1030 (2012).
- [486] I. Shirovani, K. Yamanashi, J. Hayashi, N. Ishimatsu, O. Shimomura, and T. Kikegawa, *Solid State Communications* **127**, 573 (2003).
- [487] J. Leger, D. Ravot, and J. Rossat Mignod, *Journal of Physics C* **17**, 4935 (1984).
- [488] A. Tyvanchuk, T. Yanson, B. Y. Kotur, O. Zarechnyuk, and M. Kharakterova, *Izvestiya Akademii Nauk SSSR, Metally* **1988**, 187 (1988).
- [489] M. Fornasini, F. Merlo, and M. Pani, *Zeitschrift für Kristallographie-New Crystal Structures* **216**, 23 (2001).
- [490] R. Pöttgen, *Zeitschrift für Naturforschung B* **49**, 1525 (1994).
- [491] K. Portnoi, V. Romashov, and S. Salibekov, *Soviet Powder Metallurgy and Metal Ceramics* **10**, 925 (1971).
- [492] J. Helgorsky, *Ann Chim* **6**, 1339 (1961).
- [493] O. Reckeweg and F. J. DiSalvo, *Zeitschrift für Naturforschung B* **69**, 289 (2014).
- [494] M. Sahlberg and Y. Andersson, *Acta Crystallographica Section C: Crystal Structure Communications* **65**, i7 (2009).
- [495] G. Bruzzone and F. Merlo, *Journal of the Less Common Metals* **32**, 237 (1973).
- [496] H. Holleck, W. Rieger, H. Nowotny, and F. Benesovsky, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **95**, 552 (1964).
- [497] S. Popova and V. Putro, *Inorganic materials* **15**, 947 (1979).
- [498] K. Schubert, A. Raman, and W. Rossteutscher, *Naturwissenschaften* **51**, 506 (1964).
- [499] G. Bruzzone and F. Merlo, *Journal of the Less Common Metals* **35**, 153 (1974).
- [500] B. J. Wieder, B. Bradlyn, Z. Wang, J. Cano, Y. Kim, H.-S. D. Kim, A. Rappe, C. Kane, and B. A. Bernevig, *arXiv preprint arXiv:1705.01617* (2017).
- [501] F. Hulliger and B. Xue, *Journal of alloys and compounds* **215**, 267 (1994).
- [502] R. Pöttgen, *Zeitschrift für Naturforschung B* **50**, 1505 (1995).
- [503] G. Steinberg and H.-U. Schuster, *Zeitschrift für Naturforschung B* **34**, 1237 (1979).
- [504] G. Melnyk, H. Kandpal, L. Gulay, and W. Tremel, *Journal of alloys and compounds* **370**, 217 (2004).
- [505] Y. Wang, T. Yao, J.-L. Yao, J. Zhang, and H. Gou, *Physical Chemistry Chemical Physics* **15**, 183 (2013).
- [506] M. J. Kirkham, A. M. dos Santos, C. J. Rawn, E. Lara-Curzio, J. W. Sharp, and A. J. Thompson, *Physical Review B* **85**, 144120 (2012).
- [507] G. Ryu, S. W. Kim, H. Mizoguchi, S. Matsuishi, and H. Hosono, *EPL (Europhysics Letters)* **99**, 27002 (2012).
- [508] W. Pearson, *Zeitschrift für Kristallographie-Crystalline Materials* **171**, 23 (1985).
- [509] B. Eisenmann, H. Schäfer, and A. Weiss, *Zeitschrift für anorganische und allgemeine Chemie* **391**, 241 (1972).
- [510] R. Vogel and H.-U. Schuster, *Zeitschrift für Naturforschung B* **34**, 1719 (1979).
- [511] A. Klein Haneveld and F. Jellinek, *Recueil des Travaux Chimiques des Pays-Bas* **83**, 776 (1964).
- [512] A. Vendl, *Monatshefte für Chemie-Chemical Monthly* **109**, 1001 (1978).
- [513] S. Ji, M. Imai, H. Zhu, and S. Yamanaka, *Inorganic chemistry* **52**, 3953 (2013).
- [514] L. Man, V. Parmon, R. Imamov, and A. Avilov, *Kristallografiya* **25**, 1070 (1980).
- [515] J. A. Kurzman, M.-S. Miao, and R. Seshadri, *Journal of Physics: Condensed Matter* **23**, 465501 (2011).
- [516] P. W. Brown and F. Worzala, *Journal of Materials Science* **11**, 760 (1976).

- [517] A. Raman, *Aluminium* **41**, 318 (1965).
- [518] N. Kumada, N. Takahashi, N. Kinomura, and A. Sleight, *Materials research bulletin* **32**, 1003 (1997).
- [519] D. Taylor, *Transactions and journal of the British Ceramic Society* **83**, 32 (1984).
- [520] Z. Wang and G. Wang, *Physics Letters A* **381**, 2856 (2017).
- [521] I. Shaplygin, G. Aparnikov, and V. Lazarev, *Russian Journal of Inorganic Chemistry* **23**, 488 (1978).
- [522] M. H. Fernandez and B. Chamberland, *Journal of the Less Common Metals* **99**, 99 (1984).
- [523] A. Ivanovskii, T. Chupakhina, V. Zubkov, A. Tyutyunnik, V. Krasilnikov, G. Bazuev, S. Okatov, and A. Lichtenstein, *Physics Letters A* **348**, 66 (2005).
- [524] M. Golovei, M. Rigan, I. Olekseyuk, and Y. Voroshilov, *Inorganic Materials* **9**, 1354 (1973).
- [525] Z. Wang, H. Weng, Q. Wu, X. Dai, and Z. Fang, *Physical Review B* **88**, 125427 (2013).
- [526] E. Atabaeva, *Soviet Physics-Solid State* **15**, 2346 (1974).
- [527] B. Eisenmann, N. May, W. Müller, H. Schäfer, A. Weiss, J. Winter, and G. Ziegler, *Zeitschrift für Naturforschung B* **25**, 1350 (1970).
- [528] N. May and H. Schäfer, *Zeitschrift für Naturforschung B* **27**, 864 (1972).
- [529] W. Dörrscheidt, N. Niess, and H. Schäfer, *Zeitschrift für Naturforschung B* **31**, 890 (1976).
- [530] S. Yamanaka, M. Kajiyama, S. N. Sivakumar, and H. Fukuoka, *High Pressure Research* **24**, 481 (2004).
- [531] N. May and H. Schäfer, *Zeitschrift für Naturforschung B* **27**, 864 (1972).
- [532] Z. Nong, J. Zhu, X. Yang, Y. Cao, Z. Lai, and Y. Liu, *Physica B: Condensed Matter* **407**, 3555 (2012).
- [533] S. Sridharan and H. Nowotny, *Chemischer Informationsdienst* **74**, 468 (1983).
- [534] Y. Duan, B. Huang, Y. Sun, M. Peng, and S. Zhou, *Journal of Alloys and Compounds* **590**, 50 (2014).
- [535] D. K. Das and D. T. Pitman, *Journal of Metals* **209**, 1175 (1957).
- [536] F. Tappe, S. F. Matar, C. Schwickert, F. Winter, B. Gerke, and R. Pöttgen, *Monatshefte für Chemie-Chemical Monthly* **144**, 751 (2013).
- [537] B. Aurivillius, *Chemica Scripta* **27**, 397 (1987).
- [538] A. Eichhöfer, D. Fenske, and O. Fuhr, *Zeitschrift für anorganische und allgemeine Chemie* **623**, 762 (1997).
- [539] F. Von Batchelder and R. Ræuchle, *Acta Crystallographica* **11**, 122 (1958).
- [540] G. Bruzzone, *Boll. Sci. Fac. Chim. Ind. Bologn* **24**, 113 (1966).
- [541] K. Deller and B. Eisenmann, *Zeitschrift für Naturforschung B* **31**, 29 (1976).
- [542] A. Belgacem-Bouzida, M. Notin, and J. Hertz, *Scripta metallurgica et materialia* **25**, 431 (1991).
- [543] Y. Ge, W. Wan, Y. Liu, and Y. Zhang, *Journal of Physics: Condensed Matter* **29**, 415701 (2017).
- [544] S. Popova and V. Putro, *Inorganic materials* **15**, 947 (1979).
- [545] S. Amerioun and U. Häussermann, *Inorganic chemistry* **42**, 7782 (2003).
- [546] K. Schubert, S. Bhan, T. Biswas, K. Frank, and P. Panday, *Naturwissenschaften* **55**, 542 (1968).
- [547] G. Y. Yonggang and N. L. Ross, *Journal of Physics: Condensed Matter* **23**, 055401 (2011).
- [548] F. Merlo and M. Fornasini, *Materials research bulletin* **29**, 149 (1994).
- [549] A. N. Christensen, *Journal of crystal growth* **129**, 266 (1993).
- [550] K. Schubert, H. Meissner, A. Raman, and W. Rossteutscher, *Naturwissenschaften* **51**, 287 (1964).
- [551] A. Dwight, J. Downey, and R. Conner, *Acta Crystallographica (1,1948-23,1967)* **22**, 745 (1967).
- [552] O. McMasters, K. Gschneidner, G. Bruzzone, and A. Palenzona, *Journal of the Less-Common Metals* **25**, 135 (1971).
- [553] R.-H. Odenthal and R. Hoppe, *Monatshefte für Chemie/Chemical Monthly* **102**, 1340 (1971).
- [554] E. Hellner and F. Laves, *Zeitschrift für Naturforschung A* **2**, 177 (1947).
- [555] H. Nowotny, O. Schob, and F. Benesovsky, *Monatshefte fuer Chemie* **92**, 1300 (1961).
- [556] T. Doert, S. Hoffkes, C. Klein, and P. Boettcher, *Zeitschrift fuer Kristallographie, Supplement Issue* **3**, 52 (1991).
- [557] E. Havinga, H. Damsma, and P. Hokkeling, *Journal of the Less Common Metals* **27**, 169 (1972).
- [558] K. Alasafi and K. Schubert, *Journal of the Less-Common Metals* **65**, P23 (1979).
- [559] B. Li and J. D. Corbett, *Cheminform* **128**, 12392 (2006).
- [560] M. Marko, Y. Kuz'ma, and E. Gladyshevskii, *Dopovidi Akademii Nauk Ukrains'koi RSR, Seriya A: Fiziko-Matematichni Ta Tekhnichni Nauki* **38**, 555 (1976).
- [561] G. S. Pisarenko and N. S. Mozharovskii, *Soviet Powder Metallurgy Metal Ceramics* **5**, 133 (1966).
- [562] E. Havinga, H. Damsma, and P. Hokkeling, *Journal of the Less Common Metals* **27**, 169 (1972).
- [563] H. Y. Yan, Q. Wei, S. M. Chang, and P. Guo, *Trans. Nonferrous Met. Soc. China* **21**, 1627 (2011).
- [564] E. Havinga, H. Damsma, and P. Hokkeling, *Journal of the Less Common Metals* **27**, 169 (1972).
- [565] R. J. Nelmes, D. R. Allan, M. I. McMahon, and S. A. Belmonte, *Phys. Rev. Lett* **83**, 4081 (1999).
- [566] E. Havinga, H. Damsma, and P. Hokkeling, *Journal of the Less Common Metals* **27**, 169 (1972).
- [567] T. Doert, S. Hoffkes, C. Klein, and P. Boettcher, *Zeitschrift fuer Kristallographie, Supplement Issue* **3**, 52 (1991).
- [568] A. Palenzona, *Journal of The Less-Common Metals* **78**, 49 (1981).
- [569] B. Eisenmann and H. Schaefer, *Zeitschrift fuer Naturforschung, Teil B. Anorganische Chemie, Organische Chemie* **29**, 460 (1974).
- [570] C. Hoch, J. Bender, and A. Simon, *Angewandte Chemie* **48**, 2415 (2009).
- [571] K. Schubert, H. G. Meissner, A. Raman, and W. Rossteutscher, *Naturwissenschaften* **51**, 287 (1964).
- [572] Y. Oya, Y. Mishima, and T. Suzuki, *Z. Metallkd.* **78**, 485 (1987).
- [573] K. Schubert and M. Poetzschke, *Naturwissenschaften* **53**, 474 (1962).
- [574] K. Schubert, H. Lukas, H. Meissner, and S. Bhan, *Zeitschrift fuer Metallkunde* **50**, 534 (1959).
- [575] B. Y. Kotur, *Izvestiya Akademii Nauk SSSR, Metally* **1991**, 213 (1991).

- [576] P. Stecher, F. Benesovsky, and H. Nowotny, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **94**, 1154 (1963).
- [577] Y. D. Seropegin and M. V. Rudometkina, *Journal of The Less-Common Metals* **135**, 127 (1987).
- [578] S. Popova, *Fizika Tehnika Vysokikh Davlenij* **11**, 3 (1983).
- [579] R. Horyn and K. Lukaszewicz, *Bulletin de l'Academie Polonaise des Sciences, Serie des Sciences Chimiques* **18**, 59 (1970).
- [580] M. Tillard, *Journal of Alloys Compounds* **584**, 385 (2014).
- [581] G. Bruzzone, E. Franceschi, and F. Merlo, *Journal of the Less-Common Metals* **60**, 59 (1978).
- [582] K. Schubert, S. Bhan, T. Biswas, K. Frank, and P. Panday, *Naturwissenschaften* **55**, 542 (1968).
- [583] H. Schachner, H. Nowotny, and R. Machenschalk, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **84**, 677 (1953).
- [584] C. H. Dauben, D. H. Templeton, and C. Myers, **60**, 111 (1956).
- [585] M. McMahon, T. Bovornratanaraks, D. Allan, S. Belmonte, and R. Nelmes, *Physical Review B* **61**, 3135 (2000).
- [586] A. Gotuk, M. Babanly, and A. Kuliev, *Inorganic materials* **15**, 1062 (1979).
- [587] B. Bachmann and B. Müller, *Zeitschrift für anorganische und allgemeine Chemie* **619**, 189 (1993).
- [588] M. Müller and B. G. Müller, *Zeitschrift für anorganische und allgemeine Chemie* **621**, 1385 (1995).
- [589] S. Bhan, T. Gödecke, P. Panday, and K. Schubert, *Journal of the Less Common Metals* **16**, 415 (1968).
- [590] W. Laschkarew, *Zeitschrift für anorganische und allgemeine Chemie* **193**, 270 (1930).
- [591] M. Onoda, Y. Shi, A. Leithe-Jasper, and T. Tanaka, *Acta Crystallographica Section B: Structural Science* **57**, 449 (2001).
- [592] G. Bruzzone and F. Merlo, *Journal of the Less Common Metals* **32**, 237 (1973).
- [593] A. Mewis, *Zeitschrift fuer Naturforschung, Teil B. Anorganische Chemie, Organische Chemie* **33**, 382 (1978).
- [594] E. Gal'perin and R. Sandler, *Zeitschrift fuer Naturforschung, Teil B. Anorganische Chemie, Organische Chemie* **7**, 217 (1962).
- [595] P. Klipstein, D. Guy, E. Marseglia, J. Meakin, R. Friend, and A. Yoffe, *Journal of Physics C* **19**, 4953 (1986).
- [596] S. Aminalragia-Giamini, J. Marquez-Velasco, P. Tsipas, D. Tsoutsou, G. Renaud, and A. Dimoulas, *2D Materials* **4**, 015001 (2016).
- [597] E. Biehl and H. Deiseroth, *Zeitschrift für anorganische und allgemeine Chemie* **625**, 1337 (1999).
- [598] T. Novoselova, S. Malinov, W. Sha, and A. Zhecheva, *Materials Science and Engineering: A* **371**, 103 (2004).
- [599] A. Mewis, *Zeitschrift fuer Naturforschung, Teil B. Anorganische Chemie, Organische Chemie* **33**, 382 (1978).
- [600] A. Borghesi, C. Chen-Jia, G. Guizzetti, L. Nosenzo, E. Reguzzoni, A. Stella, and F. Lévy, *Physical Review B* **33**, 2422 (1986).
- [601] M. Wendorff and C. Roehr, *Zeitschrift fuer Naturforschung, B: Chemical Sciences* **63**, 1383 (2008).
- [602] A. Zalkin, D. Sands, R. Bedford, and O. Krikorian, *Acta Crystallographica* **14**, 63 (1961).
- [603] A. Zalkin, D. Sands, and O. Krikorian, *Acta Crystallographica* **12**, 713 (1959).
- [604] H. Wiedemeier and P. A. Siemers, *Modern High Temperature Science*, **17**, 395 (1984).
- [605] B. Sa, J. Zhou, Z. Sun, J. Tominaga, and R. Ahuja, *Physical review letters* **109**, 096802 (2012).
- [606] R. Wehrich, S. F. Matar, V. Eyert, F. Rau, M. Zabel, M. Andratschke, I. Anusca, and T. Bernert, *Progress in solid state chemistry* **35**, 309 (2007).
- [607] S. Seidlmayer, F. Bachhuber, I. Anusca, J. Rothballer, M. Bräu, P. Peter, and R. Wehrich, *Zeitschrift für Kristallographie International journal for structural, physical, and chemical aspects of crystalline materials* **225**, 371 (2010).
- [608] R. DeSando and R. Lange, *Journal of Inorganic and Nuclear Chemistry* **28**, 1837 (1966).
- [609] G. Hägg and A. Hybinette, *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science* **20**, 913 (1935).
- [610] W. Schanow and K.-J. Range, *Materials Research Bulletin* **18**, 39 (1983).
- [611] H. He, C. Tyson, and S. Bobev, *Inorganic chemistry* **50**, 8375 (2011).
- [612] K. Yamana, K. Kihara, and T. Matsumoto, *Acta Crystallographica B* **35**, 147 (1979).
- [613] J. Daams and P. Villars, *Journal of alloys and compounds* **197**, 243 (1993).
- [614] H. He, C. Tyson, and S. Bobev, *Inorganic chemistry* **50**, 8375 (2011).
- [615] J. Gullman and O. Olofsson, *Journal of Solid State Chemistry* **5**, 441 (1972).
- [616] B. Gržeta, S. Popović, N. Cowlam, and B. Čelustka, *Journal of applied crystallography* **23**, 340 (1990).
- [617] M. Zabel, S. Wandinger, and K.-J. Range, *Z. Naturforsch. 34b* **238**, 241 (1979).
- [618] S. S. Stoyko, M. Khatun, C. S. Mullen, and A. Mar, *Journal of Solid State Chemistry* **192**, 325 (2012).
- [619] J. Schuster and H. Ipser, *Metallurgical Transactions A: Physical Metallurgy and Materials Science* **22**, 1729 (1991).
- [620] R. W. Henning and J. D. Corbett, *Inorganic chemistry* **36**, 6045 (1997).
- [621] F. Averdunk and R. Hoppe, *Journal of the Less Common Metals* **161**, 135 (1990).
- [622] M. Hepworth, K. Jack, R. Peacock, and G. Westland, *Acta Crystallographica* **10**, 63 (1957).
- [623] H. Sowa and H. Ahsbahs, *Acta Crystallographica Section B* **54**, 578 (1998).
- [624] W. Blase and G. Cordier, *Zeitschrift für Kristallographie-Crystalline Materials* **194**, 150 (1991).
- [625] G. Cordier and V. Müller, *Zeitschrift für Kristallographie-Crystalline Materials* **198**, 281 (1992).
- [626] R. Chevrel, M. Potel, M. Sergent, M. Decroux, and O. Fischer, *Journal of Solid State Chemistry* **34**, 247 (1980).
- [627] M. S. Suleiman and D. P. Joubert, *arXiv preprint arXiv:1310.2751* (2013).
- [628] O. Graudejus and B. Müller, *Zeitschrift für anorganische und allgemeine Chemie* **622**, 1549 (1996).
- [629] R. Chevrel, P. Gougeon, M. Potel, and M. Sergent, *Journal of Solid State Chemistry* **57**, 25 (1985).
- [630] W. Bensch and W. Heid, *Journal of alloys and compounds* **224**, 220 (1995).

- [631] J. Huster, G. Schippers, and W. Bronger, *Journal of the Less Common Metals* **91**, 333 (1983).
- [632] M. Bencharif and K. K. Rao, *Journal of materials science* **21**, 3425 (1986).
- [633] J.-M. Tarascon, G. Hull, and F. DiSalvo, *Materials research bulletin* **19**, 915 (1984).
- [634] M. Potel, R. Chevrel, M. Sergent, J. Armici, M. Decroux, and O. Fischer, *Journal of Solid State Chemistry* **35**, 286 (1980).
- [635] J.-M. Tarascon, G. Hull, and F. DiSalvo, *Materials research bulletin* **19**, 915 (1984).
- [636] W. Wu, Y. Liu, S. Li, C. Zhong, Z.-M. Yu, X.-L. Sheng, Y. Zhao, and S. A. Yang, *Physical Review B* **97**, 115125 (2018).
- [637] J.-M. Tarascon, G. Hull, and F. DiSalvo, *Materials research bulletin* **19**, 915 (1984).
- [638] M. Potel, R. Chevrel, and M. Sergent, *Acta Crystallographica Section B* **36**, 1545 (1980).
- [639] C. D. Malliakas and M. G. Kanatzidis, *Journal of the American Chemical Society* **135**, 1719 (2013).
- [640] F. Merlo, M. Pani, and M. Fornasini, *Journal of Alloys and Compounds* **196**, 145 (1993).
- [641] E. Zhao, J. Wang, J. Meng, and Z. Wu, *Computational Materials Science* **47**, 1064 (2010).
- [642] W. Eitel and W. Skalik, *Zeitschrift für anorganische und allgemeine Chemie* **183**, 263 (1929).
- [643] J. Schuster, E. Rudy, and H. Nowotny, *Monatshefte für Chemie/Chemical Monthly* **107**, 1167 (1976).
- [644] J. Yang and F. Gao, *physica status solidi (b)* **247**, 2161 (2010).
- [645] D. V. Suetin, I. R. Shein, and A. L. Ivanovskii, *Journal of Physics and Chemistry of Solids* **70**, 64 (2009).
- [646] R. Eppinga and G. Wiegiers, *Physica B+ C* **99**, 121 (1980).
- [647] C. Sunandana, K. Chandrasekaran, G. Aravamudan, and G. S. Rao, *Journal of the Less Common Metals* **84**, 115 (1982).
- [648] P. Pandit and S. P. Sanyal, in *AIP Conference Proceedings*, Vol. 1349 (AIP, 2011) pp. 855–856.
- [649] R. R. Palanichamy and M. Santhosh, in *AIP Conference Proceedings*, Vol. 1536 (AIP, 2013) pp. 295–296.
- [650] M. S. Suleiman and D. P. Joubert, arXiv preprint arXiv:1310.2751 (2013).
- [651] S. Wang, X. Yu, Z. Lin, R. Zhang, D. He, J. Qin, J. Zhu, J. Han, L. Wang, H.-k. Mao, *et al.*, *Chemistry of Materials* **24**, 3023 (2012).
- [652] E. Zhao, J. Wang, J. Meng, and Z. Wu, *Computational Materials Science* **47**, 1064 (2010).
- [653] G. Soto, *Computational Materials Science* **61**, 1 (2012).
- [654] V. Slovyanskikh, N. Kuznetsov, and N. Gracheva, *Zhurnal Neorganicheskoi Khimii* **29**, 1898 (1984).
- [655] V. Slovyanskikh, N. Kuznetsov, and N. Gracheva, *Zhurnal Neorganicheskoi Khimii* **29**, 1898 (1984).
- [656] S. F. Bartram, *The Crystallography of Some Titanium Sulfides*, Ph.D. thesis, Rutgers University (1958).
- [657] G. Örylgsson and B. Harbrecht, *Zeitschrift für Naturforschung B* **54**, 1125 (1999).
- [658] A. Lachgar, D. S. Dudis, P. K. Dorhout, and J. D. Corbett, *Inorganic Chemistry* **30**, 3321 (1991).
- [659] A. Dwight, M. Mueller, R. CONNER, J. Downey, and H. Knott, *Trans Met Soc AIME* **242**, 2075 (1968).
- [660] J. Prchal, H. Kitazawa, and O. Suzuki, *Journal of alloys and compounds* **437**, 117 (2007).
- [661] Y. Verbovytsky and K. Latka, *Chemistry of metals and alloys* **1**, 261 (2008).
- [662] R. Ferro, R. Marazza, and G. Rambaldi, *Zeitschrift fuer Metallkunde* **65**, 40 (1974).
- [663] E. Hovestreydt, N. Engel, K. Klepp, B. Chabot, and E. Parthé, *Journal of the Less Common Metals* **85**, 247 (1982).
- [664] W. Wopersnow and K. Schubert, *Journal of the Less Common Metals* **52**, 1 (1977).
- [665] K. Anderko and K. Schubert, *ZEITSCHRIFT FÜR METALLKUNDE* **44**, 307 (1953).
- [666] R. Ferro, R. Marazza, and G. Rambaldi, *Zeitschrift für Metallkunde* **65**, 37 (1974).
- [667] Y. V. Galadzhun, Z. Vasyli, H. Piotrowski, P. Mayer, R.-D. Hoffmann, and R. Poettgen, *Zeitschrift für Naturforschung B* **55**, 1025 (2000).
- [668] V. I. Zaremba, U. C. Rodewald, V. P. Dubenskiy, B. Heying, K. Katoh, Y. Niide, A. Ochiai, R. Pöttgen, *et al.*, *Monatshefte für Chemie/Chemical Monthly* **137**, 249 (2006).
- [669] A. Iandelli, *Journal of alloys and compounds* **203**, 137 (1994).
- [670] V. Petrunin and N. Sorokin, *INORG. MATER. Inorg. Mater.* **18**, 1733 (1982).
- [671] R. Ferro, R. Marazza, and G. Rambaldi, *Zeitschrift fuer Metallkunde* **65**, 40 (1974).
- [672] T. Mishra, G. Heymann, H. Huppertz, and R. Pöttgen, *Intermetallics* **20**, 110 (2012).
- [673] O. Laborde, U. Gottlieb, and R. Madar, *Journal of low temperature physics* **95**, 835 (1994).
- [674] A. Tkachuk and A. Mar, *Journal of alloys and compounds* **442**, 122 (2007).
- [675] K. Schubert, S. Bhan, W. Burkhardt, R. Gohle, H. Meissner, M. Pötzschke, and E. Stolz, *Naturwissenschaften* **47**, 303 (1960).
- [676] H. Wang, Y. Zhan, and M. Pang, *Solid State Communications* **152**, 462 (2012).
- [677] Y. Verbovytsky and K. Latka, *Journal of alloys and compounds* **431**, 130 (2007).
- [678] K. Petry, W. Klünter, and W. Jung, *Zeitschrift für Kristallographie* **209**, 151 (1994).
- [679] R. Demchyna, Y. Prots, U. Burkhardt, U. Schwarz, and Y. Grin, *Zeitschrift für Kristallographie-New Crystal Structures* **221**, 427 (2006).
- [680] M. F. Zumdick, R.-D. Hoffmann, and R. Pöttgen, *Zeitschrift für Naturforschung B* **54**, 45 (1999).
- [681] W. Müller, *Zeitschrift für Naturforschung B* **32**, 357 (1977).
- [682] T. Harmening, C. P. Sebastian, L. Zhang, C. Fehse, H. Eckert, and R. Pöttgen, *Solid State Sciences* **10**, 1395 (2008).
- [683] I. Zeiringer, N. Melnychenko-Koblyuk, A. Grytsiv, E. Bauer, G. Giester, and P. Rogl, *Journal of Phase Equilibria Diffusion* **32**, 115 (2011).
- [684] U. Zachwieja, *Journal of alloys and compounds* **196**, 187 (1993).
- [685] H. Klesnar, T. Aselage, B. Morosin, and G. Kwei, *Journal of alloys and compounds* **241**, 180 (1996).
- [686] W. Harms, M. Wendorff, and C. Roehr, *Zeitschrift Fr Naturforschung B* **62**, 177 (2007).

- [687] N. Zhuravlev, N. Esaulov, and I. Rall, *SOV PHYS CRYSTALLOGR* **15**, 315 (1970).
- [688] E. Rudy, F. Benesovsky, H. Nowotny, and L. E. Toth, *Monatshefte Fr Chemie Und Verwandte Teile Anderer Wissenschaften* **92**, 692 (1961).
- [689] P. I. Kripyakevich and E. I. Gladyshevskii, *Soviet Phys.-Cryst.* **6**, 94 (1961).
- [690] A. Zalkin, R. G. Bedford, and D. Sands, *Acta Crystallographica* **12**, 700 (2010).
- [691] F. Laves, *Naturwissenschaften* **31**, 145 (1943).
- [692] W. F. Harms, *Dissertation Universitaet Freiburg/Breisgau* **2008**, 1 (2008).
- [693] J. D. Zhang and X. L. Cheng, *Physica B Physics of Condensed Matter* **405**, 3532 (2010).
- [694] T. Chihi, M. Fatmi, J. Parlebas, and M. Guemmaz, *European Physical Journal Applied Physics* **55**, 57 (2011).
- [695] M. Puselj and Z. Ban, *Journal of The Less-Common Metals* **37**, 213 (1974).
- [696] J. Schoen, M. Wevers, and M. Jansen, *Solid State Sciences* **2**, 449 (2000).
- [697] G. V. Vajenine, X. Wang, I. Efthimiopoulos, S. Karmakar, K. Syassen, and M. Hanfland, *Physical Review B Condensed Matter* **79**, (2009).
- [698] Y. A. Buslaev, G. Safronov, V. Pachomov, M. Glushkova, V. Repko, M. Ershova, A. Zhukov, and T. Zhdanova, *Izvestiya Akademii Nauk SSSR, Neorganicheskie Materialy* **5**, 45 (1969).
- [699] T. Chihi, M. Fatmi, and B. Ghebouli, *Solid State Communications* **151**, 1672 (2011).
- [700] Chihi, Fatmi, Parlebas, J.C, and Guemmaz, *European Physical Journal Applied Physics* **55**, 57 (2011).
- [701] Y. G. Yu and N. L. Ross, *Journal of Physics Condensed Matter* **23**, 055401 (2011).
- [702] L. Gulai, V. Zaremba, Y. M. Kalychak, and N. Koblyuk, *Inorganic materials* **35**, 471 (1999).
- [703] Y.-U. Kwon and J. D. Corbett, *Journal of alloys and compounds* **190**, 219 (1993).
- [704] E. Garcia and J. D. Corbett, *Inorganic Chemistry* **29**, 3274 (1990).
- [705] Y. U. Kwon and J. D. Corbett, *Chemistry of materials* **4**, 1348 (1992).
- [706] H. Boller, H. Nowotny, and A. Wittmann, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **91**, 1174 (1960).
- [707] J. Schuster and J. Bauer, *Journal of nuclear materials* **120**, 133 (1984).
- [708] J. Schuster and H. Nowotny, *Zeitschrift fuer Metallkunde* **71**, 341 (1980).
- [709] L. Edshammar and S. Andersson, *ACTA CHEMICA SCANDINAVICA* **14**, 223 (1960).
- [710] R. Nandedkar and P. Delavignette, *physica status solidi (a)* **73**, K157 (1982).
- [711] Y.-U. Kwon and J. D. Corbett, *Journal of alloys and compounds* **190**, 219 (1993).
- [712] E. Garcia and J. D. Corbett, *Inorganic Chemistry* **29**, 3274 (1990).
- [713] Y. U. Kwon and J. D. Corbett, *Chemistry of materials* **4**, 1348 (1992).
- [714] A. Huetz and G. Nagorsen, *Zeitschrift fuer Metallkunde* **66**, 314 (1975).
- [715] B. Better, A. Hutz, and G. Nagorsen, *Zeitschrift für Metallkunde* **67**, 118 (1976).
- [716] H. Nowotny, F. Benesovsky, E. Rudy, and A. Wittmann, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **91**, 975 (1960).
- [717] Y. U. Kwon and J. D. Corbett, *Chemistry of materials* **4**, 1348 (1992).
- [718] U. Steinbrenner and A. Simon, *Zeitschrift für anorganische und allgemeine Chemie* **624**, 228 (1998).
- [719] B. Eisenmann and K. Deller, *Zeitschrift für Naturforschung B* **30**, 66 (1975).
- [720] B. Eisenmann and K. Deller, *Zeitschrift für Naturforschung B* **30**, 66 (1975).
- [721] E. Garcia and J. D. Corbett, *Inorganic Chemistry* **29**, 3274 (1990).
- [722] Y. U. Kwon and J. D. Corbett, *Chemistry of materials* **4**, 1348 (1992).
- [723] E. A. Leon-Escamilla and J. D. Corbett, *Chemistry of materials* **18**, 4782 (2006).
- [724] Y.-U. Kwon and J. D. Corbett, *Journal of alloys and compounds* **190**, 219 (1993).
- [725] G. Natta, P. Corradini, and G. Allegra, *Journal of Polymer Science* **51**, 399 (1961).
- [726] C. Park, S. W. Kim, and M. Yoon, *Physical review letters* **120**, 026401 (2018).
- [727] J. Watts, *Inorganic Chemistry* **5**, 281 (1966).
- [728] Y. U. Kwon and J. D. Corbett, *Chemistry of materials* **4**, 1348 (1992).
- [729] N. Belyavina and P. Suprunenko, *Phys. Met.(USSR)* **4**, 179 (1982).
- [730] W. Jeitschko, H. Nowotny, and F. Benesovsky, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **94**, 844 (1963).
- [731] O. Schob and E. Parthé, *Acta Crystallographica* **17**, 1335 (1964).
- [732] S. Popova and V. Putro, *INORGANIC MATERIALS* **15**, 947 (1979).
- [733] M. Drys, R. Kubiak, and K. Lukaszewicz, *Bulletin de l'Academie Polonaise des Sciences. Serie des Sciences Chimiques* **21**, 901 (1973).
- [734] K. Schubert, H. Meissner, M. Pötzschke, W. Rossteutscher, and E. Stolz, *Naturwissenschaften* **49**, 57 (1962).
- [735] Y.-U. Kwon and J. D. Corbett, *Journal of alloys and compounds* **190**, 219 (1993).
- [736] W. Jeitschko, H. Nowotny, and F. Benesovsky, *Monatshefte fuer Chemie* **95**, 1242 (1964).
- [737] H. Nowotny, A. W. Searcy, and J. Orr, *The Journal of Physical Chemistry* **60**, 677 (1956).
- [738] J. Arbuckle and E. Parthe, *Acta Crystallographica* **15**, 1205 (1962).
- [739] E. Parthé and J. Norton, *Acta Crystallographica* **11**, 14 (1958).
- [740] E. Parthe, *Acta Crystallographica* **13**, 868 (1960).
- [741] L. F. Dahl, T.-I. Chiang, P. W. Seabaugh, and E. M. Larsen, *Inorganic Chemistry* **3**, 1236 (1964).
- [742] Q. D. Gibson, *Prediction, synthesis and characterization of new topological materials*, Ph.D. thesis, Princeton University (2016).

- [743] W. Rieger and E. Parthé, *Acta Crystallographica Section B: Structural Crystallography and Crystal Chemistry* **24**, 456 (1968).
- [744] O. Karpinsky and B. Evseev, *Izvestiya Akademii Nauk SSSR, Metally* **1969**, 166 (1969).
- [745] W. Rieger, H. Nowotny, and F. Benesovsky, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **96**, 232 (1965).
- [746] G. Brauer and R. Rudolph, *Zeitschrift für anorganische und allgemeine Chemie* **248**, 405 (1941).
- [747] P. Seabaugh and L. Dahl, *American Chemical Society: Abstracts of Papers* **141**, 8M (1962).
- [748] J. Angelkort, A. Senyshyn, A. Schönleber, and S. van Smaalen, *Zeitschrift für Kristallographie Crystalline Materials* **226**, 640 (2011).
- [749] Z. Song, J. Qi, J. Lu, C. Wang, Y. Yang, D. Yu, M.-H. Yung, J. Yang, J. Li, and J. Feng, arXiv preprint arXiv:1712.07696 (2017).
- [750] L. F. Dahl, T.-I. Chiang, P. W. Seabaugh, and E. M. Larsen, *Inorganic Chemistry* **3**, 1236 (1964).
- [751] Y.-U. Kwon and J. D. Corbett, *Journal of alloys and compounds* **190**, 219 (1993).
- [752] A. Benabbas, M. Borel, A. Grandin, A. Leclaire, and B. Raveau, *Acta Crystallographica Section C* **49**, 439 (1993).
- [753] H. Schachner, E. Cerwenka, and H. Nowotny, *Monatshefte fuer Chemie und verwandte Teile anderer Wissenschaften* **85**, 245 (1954).
- [754] Y. U. Kwon and J. D. Corbett, *Chemistry of materials* **4**, 1348 (1992).
- [755] N. Terao, *Journal of the Less Common Metals* **23**, 159 (1971).
- [756] V. Petrunin, N. Sorokin, I. Borovinskaya, and A. Pityulin, *Powder Metallurgy and Metal Ceramics* **19**, 191 (1980).
- [757] R. Horyń and R. Andruszkiewicz, *Journal of the Less Common Metals* **71**, P9 (1980).
- [758] Y. Lomnitskaya and L. Koval', *Zhurnal Neorganicheskoi Khimii* **41**, 1925 (1996).
- [759] E. Parthe, H. Nowotny, and H. Schmid, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **86**, 385 (1955).
- [760] Y.-U. Kwon and J. D. Corbett, *Journal of alloys and compounds* **190**, 219 (1993).
- [761] Y. U. Kwon and J. D. Corbett, *Chemistry of materials* **4**, 1348 (1992).
- [762] G. Brauer, K. Gingerich, and M. Knausenberger, *Angewandte Chemie* **76**, 187 (1964).
- [763] Y.-U. Kwon and J. D. Corbett, *Journal of alloys and compounds* **190**, 219 (1993).
- [764] W. Jeitschko and E. Parthé, *Acta Crystallographica* **19**, 275 (1965).
- [765] W. Jeitschko and E. Parthé, *Acta Crystallographica* **19**, 275 (1965).
- [766] E. Garcia and J. D. Corbett, *Inorganic Chemistry* **29**, 3274 (1990).
- [767] Y. U. Kwon and J. D. Corbett, *Chemistry of materials* **4**, 1348 (1992).
- [768] A. Kozlov and V. Pavlyuk, *Prace Naukowe - Wyzsza Szkola Pedagogiczna Czestochowa, Chemia i Ochrona Srodowiska* **8**, 23 (2004).
- [769] W. M. Hurng and J. D. Corbett, *Chemistry of Materials* **1**, 311 (1989).
- [770] Y. U. Kwon and J. D. Corbett, *Chemistry of materials* **4**, 1348 (1992).
- [771] H. Nowotny, H. Schachner, R. Kieffer, and F. Benesovsky, *Monatshefte für Chemie/Chemical Monthly* **84**, 1 (1953).
- [772] E. Parthe, *Acta Crystallographica* **13**, 868 (1960).
- [773] A. Mewis, *Zeitschrift Fr Naturforschung B* **34**, 1373 (1979).
- [774] A. Mewis, *Zeitschrift Fr Naturforschung B* **33**, 983 (1978).
- [775] F. Merlo, M. Pani, and M. L. Fornasini, *Journal of The Less-Common Metals* **166**, 319 (1990).
- [776] A. Iandelli, *Revue de Chimie Minerale* **24**, 28 (1987).
- [777] F. Merlo, M. Pani, and M. L. Fornasini, *Journal of The Less-Common Metals* **166**, 319 (1990).
- [778] X. Yan, A. Grytsiv, P. Rogl, H. Schmidt, G. Giester, A. Saccone, and X. Q. Chen, *Intermetallics* **17**, 336 (2009).
- [779] A. Iandelli, *Journal of the Less Common Metals* **169**, 187 (1991).
- [780] A. Kverneland, V. Hansen, G. Thorkildsen, H. Larsen, P. Pattison, X.-Z. Li, and J. Gjønnes, *Materials Science Engineering A* **528**, 880 (2011).
- [781] M. Jehle, H. Scherer, M. Wendorff, and C. Roehr, *Cheminform* **182**, 1129 (2009).
- [782] J. Nuss and M. Jansen, *Zeitschrift fuer Anorganische und Allgemeine Chemie (1950) (DE)* **635**, 1514 (2009).
- [783] S. Rundqvist, B. Carlsson, B. Olofsson, and P. H. Nielsen, *Acta Chemica Scandinavica* **22**, 2395 (1968).
- [784] D. Johrendt, *Zeitschrift fuer Naturforschung, B: Chemical Sciences* **51**, 905 (1996).
- [785] G. Wenski and A. Mewis, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **535**, (2010).
- [786] W. Trzebiatowski, in *Acta Crystallographica (1,1948-23,1967)*, Vol. 10 (1957) pp. 792–793.
- [787] F. Merlo, M. Pani, and M. L. Fornasini, *Journal of The Less-Common Metals* **166**, 319 (1990).
- [788] A. Iandelli, *ChemInform* **18**, 28 (1987).
- [789] J. Nuss and M. Jansen, *Zeitschrift für anorganische und allgemeine Chemie* **635**, 1514 (2009).
- [790] W. Bronger and H. Kathage, *Journal of Alloys Compounds* **184**, 87 (1992).
- [791] U. Zachwieja, *Zeitschrift fuer Anorganische und Allgemeine Chemie (1950) (DE)* **627**, 353 (2001).
- [792] K. J. Range, F. Rau, M. Zabel, W. Bronger, U. Kathage, and G. Auffermann, *Journal of Alloys Compounds* **205**, 271 (1994).
- [793] F. Merlo, M. Pani, and M. L. Fornasini, *Journal of The Less-Common Metals* **166**, 319 (1990).
- [794] O. N. Srivastava and M. M. Srivastava, **63**, 158 (1972).
- [795] S. Stenbeck and A. Westgren, *Zeitschrift Fr Physikalische Chemie* **14b** (2017).
- [796] M. Zhang, H. Wang, H. Wang, T. Cui, and Y. Ma, *Journal of Physical Chemistry C* **114**, 6722 (2010).
- [797] F. Merlo, M. Pani, and M. L. Fornasini, *Journal of Alloys and Compounds* **196**, 145 (1993).

- [798] X.-G. Lu, C.-H. Li, L.-Y. Chen, A.-T. Qiu, and W.-Z. Ding, *Materials Chemistry and Physics* **129**, 718 (2011).
- [799] A. Karpov, J. Nuss, U. Wedig, and M. Jansen, *Cheminform* **126**, 14123 (2004).
- [800] P. C. Donohue and J. F. Weiher, *Journal of Solid State Chemistry* **10**, 142 (1974).
- [801] V. Romaka, M. Falmbigl, A. Grytsiv, and P. Rogl, *Journal of Alloys and Compounds* **585**, 287 (2014).
- [802] A. Iandelli, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **330**, 221 (1964).
- [803] G. Brauer and E. Zintl, *Zeitschrift fuer Physikalische Chemie, Abteilung B: Chemie der Elementarprozesse, Aufbau der Materie* **37**, 323 (1937).
- [804] Z. Liu, B. Zhou, Y. Zhang, Z. Wang, H. Weng, D. Prabhakaran, S.-K. Mo, Z. Shen, Z. Fang, X. Dai, *et al.*, *Science* **343**, 864 (2014).
- [805] N. Zhuravlev, V. Smirnov, and T. Migazin, *Kristallografiya* **5**, 134 (1960).
- [806] L. Jongen, T. Gloger, J. Beekhuizen, and G. Meyer, *Cheminform* **36**, (2005).
- [807] H. Womelsdorf and H.-J. Meyer, *Zeitschrift fur Kristallographie* **210**, 609 (1995).
- [808] A. Iandelli and A. Palenzona, *Atti della Accademia Nazionale dei Lincei, Classe di Fisiche, Matematiche e Naturali, Rendiconti* **37**, 165 (1964).
- [809] I. Todorov and S. C. Sevov, *Inorganic Chemistry* **45**, 4478 (2006).
- [810] W. Bronger and W. Klemm, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **319**, (1962).
- [811] E. Zhao, J. Wang, J. Meng, and Z. Wu, *Computational Materials Science* **47**, 1064 (2010).
- [812] F. J. D. Salvo, G. W. H. Jr, L. H. Schwartz, J. M. Voorhoeve, and J. V. Waszczak, *Journal of Chemical Physics* **59**, 1922 (1973).
- [813] K. R. Poeppelmeier, J. D. Corbett, T. P. McMullen, D. R. Torgeson, and R. G. Barnes, *Chemischer Informationsdienst* **11**, 129 (1980).
- [814] G. Meyer and U. Packruhn, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **524**, 90794 (2010).
- [815] L. Jongen, T. Gloger, J. Beekhuizen, and G. Meyer, *Cheminform* **631**, 582 (2005).
- [816] S. Banumathy and A. K. Singh, *Intermetallics* **19**, 1594 (2011).
- [817] A. Iandelli, *Journal of the Less Common Metals* **169**, 187 (1991).
- [818] S. Popova and V. Putro, *INORGANIC MATERIALS* **15**, 947 (1979).
- [819] F. Yu, J. X. Sun, and T. H. Chen, *Physica B Physics of Condensed Matter* **406**, 1789 (2011).
- [820] D. Music, Z. Sun, and J. M. Schneider, *Phys.rev.b* **71**, 2102 (2005).
- [821] H. F. Franzen and J. Graham, *Zeitschrift Fr Kristallographie* **123**, 133 (1966).
- [822] G. Bruzzone and F. Merlo, *Journal of the Less Common Metals* **35**, 153 (1974).
- [823] Y. Watanabe, *Journal of the Physical Society of Japan* **38**, 141 (1975).
- [824] S. K. Srivastava and B. N. Avasthi, *Journal of Materials Science* **24**, 1919 (1989).
- [825] K. Anderko, *Zeitschrift fuer Metallkunde* **49**, 165 (1958).
- [826] S. Miyazaki, K. Kawashima, T. Ipponjima, M. Fukuma, D. Hyakumura, J. Akimitsu, and M. Yoshikawa, *Journal of the Korean Physical Society* **63**, 475 (2013).
- [827] F. Wang and G. J. Miller, *Inorganic Chemistry* **50**, 7625 (2011).
- [828] T. Yamada, T. Ikeda, R. P. Stoffel, V. L. Deringer, R. Dronskowski, and H. Yamane, *Inorganic chemistry* **53**, 5253 (2014).
- [829] T. Yamada, V. L. Deringer, R. Dronskowski, and H. Yamane, *Cheminform* **43**, 4810 (2012).
- [830] F. Yu, J. X. Sun, W. Yang, R. G. Tian, and G. F. Ji, *Solid State Communications* **150**, 620 (2010).
- [831] F. Yu, J. X. Sun, and T. H. Chen, *Physica B Physics of Condensed Matter* **406**, 1789 (2011).
- [832] E. Zhao, J. Wang, J. Meng, and Z. Wu, *Computational Materials Science* **47**, 1064 (2010).
- [833] M. Rabah, D. Rached, R. Khenata, N. Moulay, and A. Zenati, *Solid State Communications* **149**, 941 (2009).
- [834] G. Soto, *Computational Materials Science* **61**, 1 (2012).
- [835] F. Wang and G. J. Miller, *Inorganic Chemistry* **50**, 7625 (2011).
- [836] W. P. F. A. M. Omloo and F. Jellinek, *Journal of The Less-Common Metals* **20**, 121 (1970).
- [837] M. Julien-Pouzol, S. Jaulmes, M. Guittard, and P. Laruelle, *Journal of Solid State Chemistry* **26**, 185 (1978).
- [838] H. Boller, *Monatshefte Fr Chemie* **104**, 166 (1973).
- [839] H. Boller, *Monatshefte Fr Chemie* **104**, 166 (1973).
- [840] T. Lundstroem and P. Snell, *Acta Chemica Scandinavica* **21**, 1343 (1967).
- [841] F. Merlo, M. Pani, and M. L. Fornasini, *Journal of the Less-Common Metals* **171**, 329 (1991).
- [842] W. S. Kim, G. Y. Chao, and L. J. Cabri, *Journal of The Less-Common Metals* **162**, 61 (1990).
- [843] J. Q. Hu, M. Xie, Y. Pan, Y. C. Yang, M. M. Liu, and J. M. Zhang, *Computational Materials Science* **51**, 1 (2012).
- [844] E. Prokin, Z. Ershova, and E. Ermolaev, *Radiokhimiya* **19**, 845 (1977).
- [845] R. Eppinga and G. A. Wiegiers, *Physica B+c* **99**, 121 (1980).
- [846] A. Kjekshus, F. Gronvold, and J. Thorbjornsen, *Acta Chemica Scandinavica (1-27,1973-42,1988)* **16**, 1493 (1962).
- [847] M. Julien-Pouzol, S. Jaulmes, M. Guittard, and P. Laruelle, *Journal of Solid State Chemistry* **26**, 185 (1978).
- [848] A. Iandelli, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **330**, 221 (1964).
- [849] F. Peng, Q. Liu, H. Fu, and X. Yang, *Solid State Communications* **149**, 56 (2009).
- [850] L. Misch, *Metallwirtschaft, Metallwissenschaft, Metalltechnik* **15**, 163 (1936).
- [851] M. Zhang, H. Yan, G. Zhang, Q. Wei, and H. Wang, *Solid State Communications* **152**, 1030 (2012).
- [852] G. Soto, *Computational Materials Science, Elsevier* **61**, 1 (2012).
- [853] V. V. Bannikov, I. Shein, and A. Ivanovskii, *Physica Status Solidi B - Basic Solid State Physics* **248**, 1369 (2011).
- [854] T. Johrendt and A. Mewis, *Journal of Alloys and Compounds* **183**, 210 (1992).

- [855] J. Crain, R. Piltz, G. Ackland, S. Clark, M. Payne, V. Milman, J. Lin, P. Hatton, and Y. Nam, *Physical Review B* **50**, 8389 (1994).
- [856] H. Pauly, A. Weiss, and H. Witte, *Z METALLKUNDE* **59**, 47 (1968).
- [857] H. Lin, T. Das, Y. J. Wang, L. Wray, S.-Y. Xu, M. Hasan, and A. Bansil, *Physical Review B* **87**, 121202 (2013).
- [858] M. J. Kirkham, A. M. Dos Santos, C. J. Rawn, E. Laracurzio, J. W. Sharp, and A. J. Thompson, *Physical Review B* **85**, 4506 (2012).
- [859] M. Mbarki, R. Alaya, and A. Rebey, *Solid State Communications* **155**, 12 (2013).
- [860] S. Massidda, A. Continenza, A. J. Freeman, T. M. de Pascale, F. Meloni, and M. Serra, *Physical Review B Condensed Matter* **41**, 12079 (1990).
- [861] M. Schowalter, A. Rosenauer, and K. Volz, *Acta Crystallographica Section A Foundations of Crystallography* **68**, 319 (2012).
- [862] L. S. Xie, L. M. Schoop, S. A. Medvedev, C. Felser, and R. J. Cava, *Cheminform* **45**, 6 (2014).
- [863] H. Pauly, A. Weiss, and H. Witte, *Z METALLKUNDE* **59**, 47 (1968).
- [864] U. Eberz, W. Seelentag, and H. U. Schuster, *Zeitschrift Fr Naturforschung B* **35**, 1341 (1980).
- [865] R. Marazza, D. Rossi, and R. Ferro, *Journal of the Less Common Metals* **138**, 189 (1988).
- [866] H. Huang, J. Liu, and W. Duan, *Physical Review B* **90**, 195105 (2014).
- [867] H. Nowotny and F. Holub, *Monatshefte Fr Chemie Und Verwandte Teile Anderer Wissenschaften* **91**, 877 (1960).
- [868] K. Kuriyama, M. Yahagi, and K. Iwamura, *Japanese Journal of Applied Physics* **12**, 743 (1973).
- [869] R. Matthes and H. U. Schuster, *Zeitschrift Fr Naturforschung B* **35**, 778 (1980).
- [870] W. G. Witteman, A. L. Giorgi, and D. T. Vier, *Journal of Physical Chemistry* **64**, 434 (1960).
- [871] M. E. Straumanis and C. D. Kim, *Journal of Applied Physics* **36**, 3822 (1965).
- [872] H. U. Schuster and W. Bockelmann, *Zeitschrift Fr Naturforschung B* **24**, 1189 (1969).
- [873] Q. L. Fang, J. M. Zhang, and K. W. Xu, *Journal of Magnetism and Magnetic Materials* **349**, 104 (2014).
- [874] D. A. Miranda, S. López-Rivera, C. Power, J. Henao, and M. Macías, *MRS Online Proceedings Library Archive* **1372** (2012).
- [875] M. Schowalter, A. Rosenauer, and K. Volz, *Acta Crystallographica Section A: Foundations of Crystallography* **68**, 319 (2012).
- [876] W. F. D. Jong, *Zeitschrift fr Kristallographie - Crystalline Materials* **63**, 466 (1926).
- [877] J. Drews, U. Eberz, and H. U. Schuster, *Journal of the Less Common Metals* **116**, 271 (1986).
- [878] P. Pandit and S. P. Sanyal, in *AIP Conference Proceedings*, Vol. 1349 (AIP, 2011) pp. 855–856.
- [879] W. G. Witteman, A. L. Giorgi, and D. T. Vier, *Journal of Physical Chemistry* **64**, 434 (1960).
- [880] J. Yang and F. Gao, *Physica B, Condensed Matter* **407**, 3527 (2012).
- [881] W. Thronberens and H.-U. Schuster, *Zeitschrift für Naturforschung B* **34**, 781 (1979).
- [882] G. K. Madsen, B. B. Iversen, P. Blaha, and K. Schwarz, *Physical Review B* **64**, 195102 (2001).
- [883] G. Madsen, C. Gatti, B. Iversen, L. Damjanovic, G. Stucky, and V. Srdanov, *Physical Review B* **59**, 12359 (1999).
- [884] A. T. Aldred, *Trans.met.soc.aime* **224**, 1082 (1962).
- [885] A. Sekkal, A. Benzair, T. Ouahrani, H. Faraoun, G. Merad, H. Aourag, and C. Esling, *Intermetallics* **45**, 65 (2014).
- [886] C. Y. Chen and N. A. Crouch, *Canadian Journal of Chemistry* **48**, 1703 (1970).
- [887] J. C. Schuster and J. Bauer, *Journal of Solid State Chemistry* **53**, 260 (1984).
- [888] B. Rakshit, S. P. Sanyal, and M. Celino, *Solid State Communications* **149**, 1326 (2009).
- [889] A. Hao, X. Yang, X. Wang, R. Yu, X. Liu, W. Xin, and R. Liu, *Computational Materials Science* **48**, 59 (2010).
- [890] S. S. Chouhan, G. Pagare, M. Rajagopalan, and S. P. Sanyal, *Solid State Sciences* **14**, 1004 (2012).
- [891] G. Kienast and J. Verma, *Zeitschrift fuer Anorganische und Allgemeine Chemie* (1950) (DE) **310**, 143 (1961).
- [892] K. Haddadi, A. Bouhemadou, and L. Louail, *Journal of Alloys Compounds* **504**, 296 (2010).
- [893] T. Yao, Y. Wang, H. Li, J. Lian, J. Zhang, and H. Gou, *Physica B Condensed Matter* **431**, 58 (2013).
- [894] R. Ferro, *Acta Crystallographica* **7**, 781 (1954).
- [895] E. Biehl and H. J. Deiseroth, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **625**, 1073 (2015).
- [896] U. E. Musanke and W. Jeitschko, *Zeitschrift Fr Naturforschung B* **22**, 1177 (1991).
- [897] J.-T. Zhao, Z.-C. Dong, J. Vaughey, J. E. Ostenson, and J. D. Corbett, *Journal of alloys and compounds* **230**, 1 (1995).
- [898] W. Jeitschko, H. Nowotny, and F. Benesovsky, *Monatshefte Fr Chemie Und Verwandte Teile Anderer Wissenschaften* **95**, 1040 (1964).
- [899] C. Hu, F. Wang, and Z. Zheng, *Physica B Condensed Matter* **407**, 3398 (2012).
- [900] H. Olijnyk and W. Holzappel, *Physics Letters A* **100**, 191 (1984).
- [901] H. Zimmer, H. Winzen, and K. Syassen, *Physical Review B* **32**, 4066 (1985).
- [902] R. Niewa, W. Schnelle, and F. R. Wagner, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **627**, 365 (2015).
- [903] Y. H. Duan, Y. Sun, M. J. Peng, and S. G. Zhou, *Journal of Alloys Compounds* **595**, 14 (2014).
- [904] R. Ferro, *Acta Crystallographica* **7**, 781 (1954).
- [905] E. Herlinger, *Angewandte Chemie* **42**, 797 (2010).
- [906] W. Xing, X. Q. Chen, D. Li, Y. Li, C. L. Fu, S. V. Meschel, and X. Ding, *Intermetallics* **28**, 16 (2012).
- [907] W. Jeitschko, H. Nowotny, and F. Benesovsky, *Monatshefte für Chemie und verwandte Teile anderer Wissenschaften* **95**, 436 (1964).
- [908] H. Holleck, *Journal of the Less Common Metals* **52**, 167 (1977).
- [909] S. P. Yatsenko, A. A. Semyannikov, H. O. Shkarov, and E. G. Fedorova, *Journal of the Less Common Metals* **90**, 95 (1983).

- [910] H. Nowotny, *Zeitschrift fuer Metallkunde* **34**, 247 (1942).
- [911] G. Liu, X. Zhao, and H. A. Eick, *Cheminform* **23**, 145 (1992).
- [912] A. Srivastava, M. Chauhan, and R. K. Singh, *Physica Status Solidi* **248**, 2793 (2011).
- [913] A. Maachou, B. Amrani, and M. Driz, *Physica B Condensed Matter* **388**, 384 (2007).
- [914] A. Hao, X. Yang, X. Wang, R. Yu, X. Liu, W. Xin, and R. Liu, *Computational Materials Science* **48**, 59 (2010).
- [915] H. Nowotny, K. Schubert, and U. Dettinger, *Zeitschrift fuer Metallkunde* **37**, 137 (1946).
- [916] S. H. Oh and H. M. Jang, *Journal of the American Ceramic Society* **82**, 233 (1999).
- [917] J. Q. Hu, M. Xie, Y. Pan, Y. C. Yang, M. M. Liu, and J. M. Zhang, *Computational Materials Science* **51**, 1 (2012).
- [918] X. Q. Chen, C. L. Fu, and J. R. Morris, *Intermetallics* **18**, 998 (2010).
- [919] W. Xing, X. Q. Chen, D. Li, Y. Li, C. L. Fu, S. V. Meschel, and X. Ding, *Intermetallics* **28**, 16 (2012).
- [920] H. C. Donkersloot and J. H. N. V. Vucht, *Journal of The Less-Common Metals* **20**, 83 (1970).
- [921] A. Raman and K. Schubert, *Z. Metallk* **55**, 704 (1964).
- [922] W. Xing, X. Q. Chen, D. Li, Y. Li, C. L. Fu, S. V. Meschel, and X. Ding, *Intermetallics* **28**, 16 (2012).
- [923] *Zeitschrift Fr Physikalische Chemie* **127**, 113 (1927).
- [924] A. Hao, X. Yang, X. Wang, R. Yu, X. Liu, W. Xin, and R. Liu, *Computational Materials Science* **48**, 59 (2010).
- [925] G. B. Demishev, S. S. Kabalkina, and T. N. Kolobyanina, *Physica Status Solidi* **108**, 89 (1988).
- [926] H. Samata, S. Tanaka, S. Mizusaki, Y. Nagata, T. C. Ozawa, A. Sato, and K. Kosuda, *Journal of Crystallization Process and Technology* **2**, 16 (2012).
- [927] O. Muller and R. Roy, *Advan. Chem. Ser* **98**, 28 (1971).
- [928] D. A. Keszler, J. A. Ibers, and M. H. Mueller, *Journal of the Chemical Society, Dalton Transactions* **1985**, 2369 (1985).
- [929] A. Junod, R. Flukiger, and J. Muller, *Journal of Physics and Chemistry of Solids* **37**, 27 (1976).
- [930] P. Norby, R. Dinnebier, and A. Fitch, *Inorganic chemistry* **41**, 3628 (2002).
- [931] A. Ferrari, *Gazzetta Chimica Italiana* **67**, 94 (1937).
- [932] A. Dwight and C. Kimball, *Journal of the Less Common Metals* **127**, 179 (1987).
- [933] R. Galera, J. Pierre, E. Siaud, and A. Murani, *Journal of the Less Common Metals* **97**, 151 (1984).
- [934] J. C. Jamieson, *Science* **139**, 762 (1963).
- [935] H. Yana, Q. Weib, S. Changc, and P. Guod, *Acta Physica Polonica, A* **119**, 442 (2011).
- [936] D. Sands, D. Wood, and W. Ramsey, *Acta Crystallographica* **16**, 316 (1963).
- [937] Y.-Q. Zheng, K. Peters, and H. Von Schnering, *Zeitschrift fur Kristallographie* **212**, 55 (1997).
- [938] B. Wang, Y. Liu, Y. Liu, and J.-W. Ye, *Physica B: Condensed Matter* **407**, 2542 (2012).
- [939] Z. Fu and W. Li, *Science in China Series A-Mathematics* **39**, 981 (1996).
- [940] H.-U. Schuster, *Naturwissenschaften* **53**, 360 (1966).
- [941] B. Hu, P. Wang, Y. Xiao, and L.-P. Song, *Zeitschrift für Kristallographie-New Crystal Structures* **220**, 298 (2005).
- [942] P. Wang, W. Xu, and Y.-Q. Zheng, *Zeitschrift für Kristallographie-New Crystal Structures* **218**, 25 (2003).
- [943] A. Edwards, R. Peacock, and A. Said, *JOURNAL OF THE CHEMICAL SOCIETY* **1962**, 4643 (1962).
- [944] W. Xu and Y.-Q. Zheng, *Zeitschrift für Kristallographie-New Crystal Structures* **220**, 323 (2005).
- [945] J. Beck and M. Hengstmann, *Zeitschrift für anorganische und allgemeine Chemie* **624**, 1943 (1998).
- [946] P. Wang, W. Xu, and Y.-Q. Zheng, *Zeitschrift für Kristallographie-New Crystal Structures* **217**, 301 (2002).
- [947] Y.-Q. Zheng, J. Nuss, and H. Von Schnering, *Zeitschrift für Kristallographie-New Crystal Structures* **213**, 500 (1998).
- [948] T. Endo, N. Morita, T. Sato, and M. Shimada, *Veroeffentlichung des Forschungsbereichs der Geo-Kosmoswissenschaften. 17 (High Pressure Geosci. Mater. Synth.)* **1988**, 185 (1988).
- [949] R. Schmidt, M. Kraus, and B. Mueller, *Zeitschrift fuer Anorganische und Allgemeine Chemie* **627**, 2344 (2001).
- [950] A. Dwight and C. Kimball, *Journal of the Less Common Metals* **127**, 179 (1987).
- [951] H.-U. Schuster, *Naturwissenschaften* **53**, 360 (1966).
- [952] C.-J. Kistrup and H.-U. Schuster, *Zeitschrift für anorganische und allgemeine Chemie* **410**, 113 (1974).
- [953] H. SCHONEMANN and H. SCHUSTER, *REVUE DE CHIMIE MINERALE* **13**, 32 (1976).
- [954] J. Häglund, A. F. Guillermet, G. Grimvall, and M. Körling, *Physical Review B* **48**, 11685 (1993).
- [955] W. Witteman, A. Giorgi, and D. Vier, *The Journal of Physical Chemistry* **64**, 434 (1960).
- [956] V. Vanyarkho, V. Zlomanov, and A. Novoselova, *Inorganic Materials* **3**, 1127 (1967).
- [957] B. Lombos, B. Ghicopoulos, S. Bhattacharya, and B. Pant, *Canadian Journal of Physics* **54**, 48 (1976).
- [958] F. Kubel, M. Pantazi, N. Wandl, and H. Hagemann, *Zeitschrift für anorganische und allgemeine Chemie* **640**, 3184 (2014).
- [959] W. López-Pérez, N. Simon-Olivera, J. Molina-Coronell, A. González-García, and R. González-Hernández, *Journal of Alloys and Compounds* **574**, 124 (2013).
- [960] J. Wernick, G. Hull, T. Geballe, J. Bernardini, and J. Waszczak, *Materials Letters* **2**, 90 (1983).
- [961] A. Dwight and C. Kimball, *Journal of the Less Common Metals* **127**, 179 (1987).
- [962] C. Rooymans, *Physics Letters* **4**, 186 (1963).
- [963] W. Ramsey, *Acta Crystallographica* **14**, 1091 (1961).
- [964] H.-U. Schuster, *Naturwissenschaften* **53**, 360 (1966).
- [965] J. Stöhr and H. Schäfer, *Zeitschrift für Naturforschung B* **34**, 653 (1979).
- [966] G. Brauer and J. Tiesler, *Zeitschrift für anorganische Chemie* **262**, 319 (1950).
- [967] J. Häglund, A. F. Guillermet, G. Grimvall, and M. Körling, *Physical Review B* **48**, 11685 (1993).
- [968] J. Kumar and R. Saxena, *Journal of the Less Common Metals* **147**, 59 (1989).
- [969] M. Banus, T. Reed, and A. Strauss, *Physical Review B* **5**, 2775 (1972).

- [970] N. Schonberg, *Acta Chemica Scandinavica* **8**, 627 (1954).
- [971] X.-s. Yan, P. Lin, X. Qi, and L. Yang, *International Journal of Materials Research* **102**, 381 (2011).
- [972] G. Corbel, M. Topić, A. Gibaud, and C. I. Lang, *Journal of Alloys and Compounds* **509**, 6532 (2011).
- [973] X.-Q. Wang and J.-T. Wang, *Solid State Communications* **150**, 1715 (2010).
- [974] J. Häglund, A. F. Guillermet, G. Grimvall, and M. Körling, *Physical Review B* **48**, 11685 (1993).
- [975] A. Meenaatci, R. Rajeswarapalanichamy, and K. Iyakutti, *Phase Transition* **86**, 570 (2013).
- [976] O. Winkler, *Zeitschrift fuer Metallkunde* **30**, 162 (1938).
- [977] G. Kienast, J. Verma, and W. Klemm, *Zeitschrift Fuer Anorganische Und Allgemeine Chemie* **310**, 143 (2010).
- [978] Y. Ö. Çiftci, K. Çolakoglu, E. Deligöz, and Ü. Bayhan, *Journal of Materials Science & Technology* **28**, 155 (2012).
- [979] H. Ozisik, K. Colakoglu, E. Deligoz, and H. Ozisik, *Solid State Communications* **151**, 1349 (2011).
- [980] B. L. And and J. D. Corbett, *Inorganic Chemistry* **44**, 6515 (2005).
- [981] T. Jurriaanse, *Zeitschrift fr Kristallographie - Crystalline Materials* **90**, 322 (1935).
- [982] U. Zachwieja, *Journal of Alloys and Compounds* **196**, 171 (1993).
- [983] H. G. Perltz, *The Structure of the Intermetallic Compound Au₂Pb* (K. Mattieseni trikikoda o.-ü., 1934).
- [984] E. avitskii, V. Polyakova, and E. Khorlin, *Russian Metallurgy* **1971**, 107 (1971).
- [985] M. Stuemke and G. Petzow, *Zeitschrift fuer Metallkunde* **66**, 292 (1975).
- [986] A. Zalkin, D. E. Sands, R. G. Bedford, and O. H. Krikorian, *Acta Crystallographica* **14**, 63C65 (1961).
- [987] F. Emmerling, N. Laengin, D. Petri, M. Kroecker, and C. Roehr, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **630**, 171 (2004).
- [988] W. Jeitschko, H. Holleck, H. Nowotny, and F. Benesovsky, *Monatshefte Fr Chemie Und Verwandte Teile Anderer Wissenschaften* **95**, 1004 (1964).
- [989] D. Fischer and M. J. Dr, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **629**, 1934C1936 (2003).
- [990] E. A. Wood and V. B. Compton, *Acta Crystallographica* **11**, 429C433 (1958).
- [991] W. Bronger and W. Klemm, *Zeitschrift Fr Anorganische Und Allgemeine Chemie* **319**, 58 (1962).
- [992] E. Zintl and A. Schneider, *Zeitschrift Fr Elektrochemie Und Angewandte Physikalische Chemie* **41**, 294C297 (1935).
- [993] S. Bobev and S. C. Sevov, *Journal of Solid State Chemistry* **153**, 92 (2000).
- [994] R. J. Cava, R. S. Roth, T. Siegrist, B. Hessen, J. J. Krajewski, and W. F. P. Jr, *Journal of Solid State Chemistry* **103**, 359 (1993).
- [995] A. Haas, H. J. Kutsch, and C. Krger, *European Journal of Inorganic Chemistry* **120**, 1045 (1987).
- [996] B. Böhme, M. Reibold, G. Auffermann, H. Lichte, M. Baitinger, and Y. Grin, *Zeitschrift für Kristallographie-Crystalline Materials* **229**, 677 (2014).
- [997] R. P. Elliott, *Trans.am.soc.metals* **53**, 321 (1961).
- [998] Z. Blazina and Z. Ban, *Journal of the Less Common Metals* **90**, 223 (1983).
- [999] M. Dalton and M. Kurmoo, *Synthetic Metals* **71**, 1623 (1995).
- [1000] C. P. Nash, F. M. Boyden, and L. D. Whittig, *Journal of the American Chemical Society* **82**, 89 (1960).
- [1001] E. Zintl and A. Schneider, *Zeitschrift Fr Elektrochemie Berichte Der Bunsengesellschaft Fr Physikalische Chemie* **41**, 764 (2015).
- [1002] K. N. Semenenko, V. N. Verbetskii, S. V. Mitrokhin, and V. V. Burnasheva, *Russian Journal of Inorganic Chemistry* **25**, 961 (1980).
- [1003] K. J. Range, F. Rau, and U. Klement, *Acta Crystallographica* **45**, 1069C1070 (1989).
- [1004] S. Bobev and S. C. Sevov, *Journal of Solid State Chemistry* **153**, 92 (2000).
- [1005] E. A. Wood and V. B. Compton, *Acta Crystallographica* **11**, 429 (1958).
- [1006] T. H. Geballe, B. T. Matthias, V. B. Compton, E. Corenzwit, G. W. H. Jr, and L. D. Longinotti, *Physical Review* **137**, 119 (1965).
- [1007] B. Eisenmann and J. Klein, *Zeitschrift Fr Naturforschung B* **43**, 1156 (1988).
- [1008] ElliottR.P. and RostokerW, *Transactions of the American Society for Metals* **50**, 617 (1958).
- [1009] H. Olijnyk and W. Holzappel, *Physics Letters A* **100**, 191 (1984).
- [1010] P. Romans, O. Paasche, and H. Kato, *J. Less-Common Metals* **8**, 213 (1965).
- [1011] D. McWhan and A. Jayaraman, *Applied Physics Letters* **3**, 129 (1963).
- [1012] B. Levinger, *Journal of Metals* **5**, 195 (1953).
- [1013] N. German, A. Bakanova, L. Tarasova, and Y. Sumulov, *Fizika Tverdogo Tela (Leningrad) (= Solid State Physics)* **12**, 637 (1970).