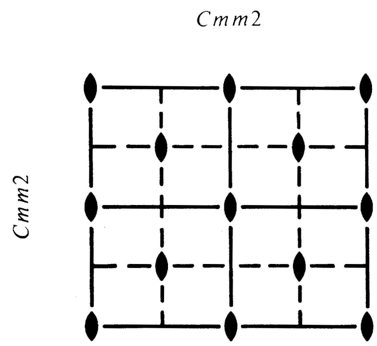
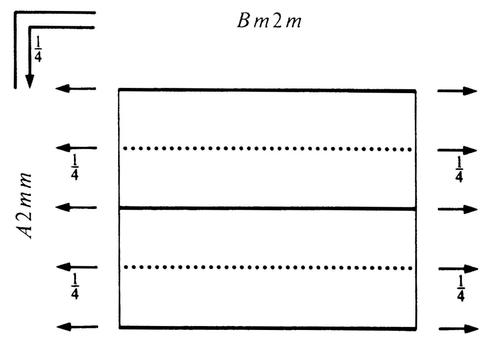
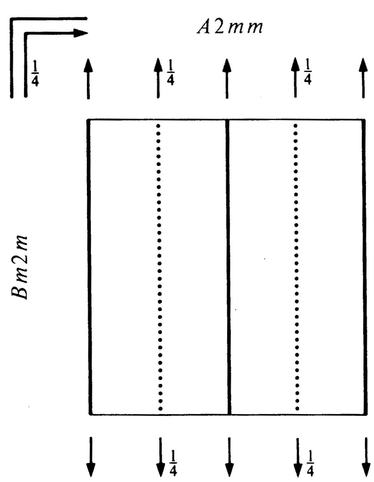
① $Cmm2$ C_{2v}^{11} $mm2$ Orthorhombic

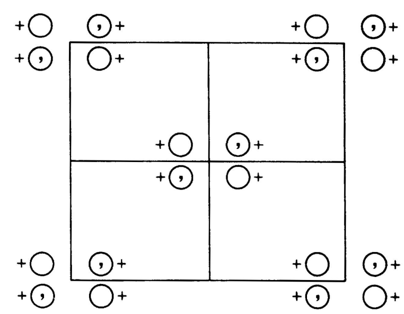
② No. 35 $Cmm2$ Patterson symmetry $Cmmm$





③





④ **Origin** on $mm2$

⑤ **Asymmetric unit** $0 \le x \le \frac{1}{4}$; $0 \le y \le \frac{1}{2}$; $0 \le z \le 1$

⑥ **Symmetry operations**

For $(0,0,0)+$ set

(1) 1 (2) $2\ \ 0,0,z$ (3) $m\ \ x,0,z$ (4) $m\ \ 0,y,z$

For $(\frac{1}{2},\frac{1}{2},0)+$ set

(1) $t(\frac{1}{2},\frac{1}{2},0)$ (2) $2\ \ \frac{1}{4},\frac{1}{4},z$ (3) $a\ \ x,\frac{1}{4},z$ (4) $b\ \ \frac{1}{4},y,z$

① *Headline*: Section 2.2.3.

Short Hermann–Mauguin symbol (Section 2.2.4 and Chapter 12.2) | Schoenflies symbol (Chapters 12.1 and 12.2) | Crystal class (Point group) (Section 10.1.1 and Chapter 12.1) | Crystal system (Section 2.1.2)

② Number of space group [Same as in *IT* (1952)] | Full Hermann–Mauguin symbol (Section 2.2.4 and Chapter 12.3) | Patterson symmetry (Section 2.2.5)

③ *Space-group diagrams*, consisting of one or several projections of the symmetry elements and one illustration of a set of equivalent points in general position. The numbers and types of the diagrams depend on the crystal system. The diagrams and their axes are described in Section 2.2.6; the graphical symbols of symmetry elements are listed in Chapter 1.4.

For monoclinic space groups see Section 2.2.16; for orthorhombic settings see Section 2.2.6.4.

④ *Origin* of the unit cell: Section 2.2.7. The site symmetry of the origin and its location with respect to the symmetry elements are given.

⑤ *Asymmetric unit*: Section 2.2.8. One choice of asymmetric unit is given.

⑥ *Symmetry operations*: Section 2.2.9 and Part 11. For each point $\tilde{x}, \tilde{y}, \tilde{z}$ of the general position that symmetry operation is listed which transforms the initial point x, y, z into the point under consideration. The symbol describes the nature of the operation, its glide or screw component (given between parentheses), if present, and the location of the corresponding symmetry element.

The symmetry operations are numbered in the same way as the corresponding coordinate triplets of the general position. For centred space groups the same numbering is applied in each block, *e.g.* under ‘For $(\frac{1}{2}, \frac{1}{2}, 0)+$ set’.

① *Headline* in abbreviated form.

② *Generators selected*: Sections 2.2.10 and 8.3.5. A set of generators, as selected for these *Tables*, is listed in the form of translations and numbers of general-position coordinates. The generators determine the sequence of the coordinate triplets in the general position and of the corresponding symmetry operations.

③ *Positions*: Sections 2.2.11 and 8.3.2. The general Wyckoff position is given at the top, followed downwards by the various special Wyckoff positions with decreasing multiplicity and increasing site symmetry. For each general and special position its multiplicity, Wyckoff letter, oriented site-symmetry symbol, as well as the appropriate coordinate triplets and the reflection conditions, are listed. The coordinate triplets of the general position are numbered sequentially; *cf. Symmetry operations*.

Oriented site-symmetry symbol (third column): Section 2.2.12. The site symmetry at the points of a special position is given in oriented form.

Reflection conditions (right-most column): Section 2.2.13.

[*Lattice complexes* are described in Part 14; Tables 14.2.3.1 and 14.2.3.2 show the assignment of Wyckoff positions to Wyckoff sets and to lattice complexes.]

④ *Symmetry of special projections*: Section 2.2.14. For each space group, orthographic projections along three (symmetry) directions are listed. Given are the projection direction, the plane group of the projection, as well as the axes and the origin of the projected cell.

⑤ *Maximal non-isomorphic subgroups*: Sections 2.2.15 and 8.3.3.

Type **I**: *translationengleiche* or *t* subgroups;
Type **IIa**: *klassengleiche* or *k* subgroups, obtained by 'decentring' the conventional cell; applies only to space groups with centred cells;
Type **IIb**: *klassengleiche* or *k* subgroups, obtained by enlarging the conventional cell.

Given are:

For types **I** and **IIa**: Index [between brackets]; 'unconventional' Hermann–Mauguin symbol of the subgroup; 'conventional' Hermann–Mauguin symbol of the subgroup, if different (between parentheses); coordinate triplets retained in subgroup.

For type **IIb**: Index [between brackets]; 'unconventional' Hermann–Mauguin symbol of the subgroup; basis-vector relations between group and subgroup (between parentheses); 'conventional' Hermann–Mauguin symbol of the subgroup, if different (between parentheses).

⑥ *Maximal isomorphic subgroups of lowest index*: Sections 2.2.15, 8.3.3 and 13.1.2.

Type **IIc**: *klassengleiche* or *k* subgroups of lowest index which are of the same type as the group, *i.e.* have the same standard Hermann–Mauguin symbol. Data as for subgroups of type **IIb**.

⑦ *Minimal non-isomorphic supergroups*: Sections 2.2.15 and 8.3.3.

The list contains the reverse relations of the subgroup tables; only types **I** (*t* supergroups) and **II** (*k* supergroups) are distinguished. Data as for subgroups of type **IIb**.

② **Generators selected** (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(\frac{1}{2},\frac{1}{2},0)$; (2); (3)

③ **Positions**

Multiplicity, Wyckoff letter, Site symmetry			Coordinates				Reflection conditions
			$(0,0,0)+$	$(\frac{1}{2},\frac{1}{2},0)+$			General:
8	f	1	(1) x,y,z	(2) $\bar{x},\bar{y},z$	(3) $x,\bar{y},z$	(4) $\bar{x},y,z$	hkl : $h+k=2n$ $0kl$: $k=2n$ $h0l$: $h=2n$ $hk0$: $h+k=2n$ $h00$: $h=2n$ $0k0$: $k=2n$
							Special: as above, plus
4	e	m . .	$0,y,z$	$0,\bar{y},z$			no extra conditions
4	d	. m .	$x,0,z$	$\bar{x},0,z$			no extra conditions
4	c	. . 2	$\frac{1}{4},\frac{1}{4},z$	$\frac{1}{4},\frac{3}{4},z$			hkl : $h=2n$
2	b	$m\,m\,2$	$0,\frac{1}{2},z$				no extra conditions
2	a	$m\,m\,2$	$0,0,z$				no extra conditions

④ **Symmetry of special projections**

Along [001] $c2mm$
$\mathbf{a}'=\mathbf{a}$ $\mathbf{b}'=\mathbf{b}$
Origin at $0,0,z$

Along [100] $p1m1$
$\mathbf{a}'=\frac{1}{2}\mathbf{b}$ $\mathbf{b}'=\mathbf{c}$
Origin at $x,0,0$

Along [010] $p11m$
$\mathbf{a}'=\mathbf{c}$ $\mathbf{b}'=\frac{1}{2}\mathbf{a}$
Origin at $0,y,0$

⑤ **Maximal non-isomorphic subgroups**

I [2] $C1m1$ (Cm, 8) (1; 3)+
[2] $Cm11$ (Cm, 8) (1; 4)+
[2] $C112$ ($P2$, 3) (1; 2)+

IIa [2] $Pba2$ (32) 1; 2; (3; 4) + $(\frac{1}{2},\frac{1}{2},0)$
[2] $Pbm2$ ($Pma2$, 28) 1; 3; (2; 4) + $(\frac{1}{2},\frac{1}{2},0)$
[2] $Pma2$ (28) 1; 4; (2; 3) + $(\frac{1}{2},\frac{1}{2},0)$
[2] $Pmm2$ (25) 1; 2; 3; 4

IIb [2] $Ima2$ ($\mathbf{c}'=2\mathbf{c}$) (46); [2] $Ibm2$ ($\mathbf{c}'=2\mathbf{c}$) ($Ima2$, 46); [2] $Iba2$ ($\mathbf{c}'=2\mathbf{c}$) (45); [2] $Imm2$ ($\mathbf{c}'=2\mathbf{c}$) (44); [2] $Ccc2$ ($\mathbf{c}'=2\mathbf{c}$) (37); [2] $Cmc2_1$ ($\mathbf{c}'=2\mathbf{c}$) (36); [2] $Ccm2_1$ ($\mathbf{c}'=2\mathbf{c}$) ($Cmc2_1$, 36)

⑥ **Maximal isomorphic subgroups of lowest index**

IIc [2] $Cmm2$ ($\mathbf{c}'=2\mathbf{c}$) (35); [3] $Cmm2$ ($\mathbf{a}'=3\mathbf{a}$ or $\mathbf{b}'=3\mathbf{b}$) (35)

⑦ **Minimal non-isomorphic supergroups**

I [2] $C\underline{m}mm$ (65); [2] $Cmme$ (67); [2] $P4mm$ (99); [2] $P4bm$ (100); [2] $P4_2cm$ (101); [2] $P4_2nm$ (102); [2] $P\bar{4}2m$ (111); [2] $P\bar{4}2_1m$ (113); [3] $P6mm$ (183)

II [2] $Fmm2$ (42); [2] $Pmm2$ ($\mathbf{a}'=\frac{1}{2}\mathbf{a},\mathbf{b}'=\frac{1}{2}\mathbf{b}$) (25)