

$\bar{4}m m m$

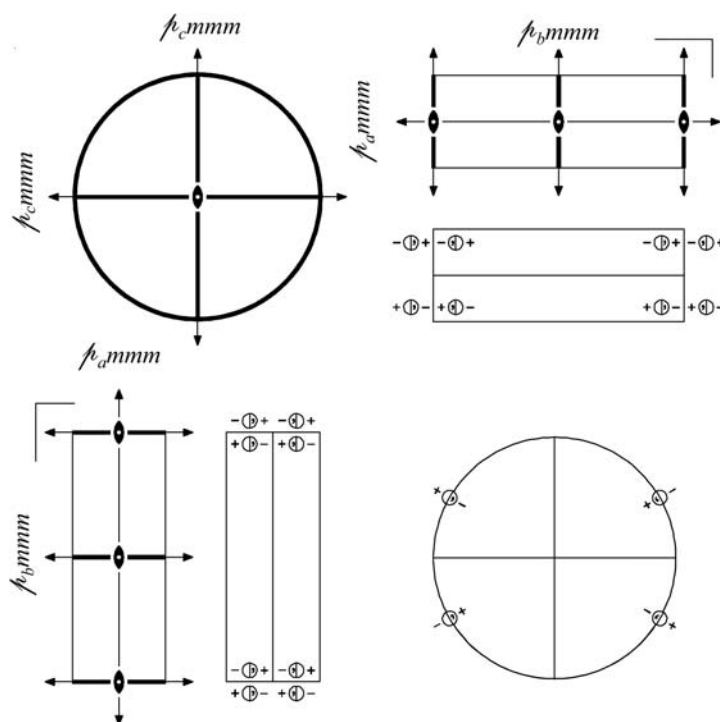
$m m m$

Orthorhombic

No. 20

$\bar{4}2/m 2/m 2/m$

Patterson symmetry $\bar{4}m m m$



Origin at centre (mmm)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq \frac{1}{2}$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m_z 0,0,0) | (7) m x,0,z
(m_y 0,0,0) | (8) m 0,y,z
(m_x 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	Reflection conditions			
		General:			
8 <i>l</i> 1	(1) x, y, z (2) \bar{x}, \bar{y}, z (3) \bar{x}, y, \bar{z} (4) x, \bar{y}, \bar{z} (5) $\bar{x}, \bar{y}, \bar{z}$ (6) x, y, \bar{z} (7) x, \bar{y}, z (8) \bar{x}, y, z	no conditions			
		Special: no extra conditions			
4 <i>k</i> $\dots m$	$x, y, \frac{1}{2}$ $\bar{x}, \bar{y}, \frac{1}{2}$ $\bar{x}, y, \frac{1}{2}$ $x, \bar{y}, \frac{1}{2}$				
4 <i>j</i> $\dots m$	$x, y, 0$ $\bar{x}, \bar{y}, 0$ $\bar{x}, y, 0$ $x, \bar{y}, 0$				
4 <i>i</i> $\dots m$	$x, 0, z$ $\bar{x}, 0, z$ $\bar{x}, 0, \bar{z}$ $x, 0, \bar{z}$				
4 <i>h</i> $m \dots$	$0, y, z$ $0, \bar{y}, z$ $0, y, \bar{z}$ $0, \bar{y}, \bar{z}$				
2 <i>g</i> $m m 2$	$0, 0, z$ $0, 0, \bar{z}$				
2 <i>f</i> $m 2 m$	$0, y, \frac{1}{2}$ $0, \bar{y}, \frac{1}{2}$				
2 <i>e</i> $m 2 m$	$0, y, 0$ $0, \bar{y}, 0$				
2 <i>d</i> $2 m m$	$x, 0, \frac{1}{2}$ $\bar{x}, 0, \frac{1}{2}$				
2 <i>c</i> $2 m m$	$x, 0, 0$ $\bar{x}, 0, 0$				
1 <i>b</i> $m m m$	$0, 0, \frac{1}{2}$				
1 <i>a</i> $m m m$	$0, 0, 0$				

Symmetry of special projections

Along [001] $2mm$

Along [100] $\bar{4}2mm$

Along [010] $\bar{4}2mm$

Origin at $0, 0, z$

$\mathbf{a}' = \mathbf{c}$
Origin at $x, 0, 0$

$\mathbf{a}' = \mathbf{c}$
Origin at $0, y, 0$

Maximal non-isotypic non-enantiomorphic subgroups

I	$[2]\bar{4}m2m (\bar{4}2mm, 18)$	1; 3; 6; 8
	$[2]\bar{4}2mm (18)$	1; 4; 6; 7
	$[2]\bar{4}mm2 (15)$	1; 2; 7; 8
	$[2]\bar{4}222 (13)$	1; 2; 3; 4
	$[2]\bar{4}112/m (11)$	1; 2; 5; 6
	$[2]\bar{4}12/m1 (\bar{4}2/m11, 6)$	1; 3; 5; 7
	$[2]\bar{4}2/m11 (6)$	1; 4; 5; 8

IIa none

IIb $[2]\bar{4}cmm (\mathbf{c}' = 2\mathbf{c}) (\bar{4}mcm, 22)$; $[2]\bar{4}mcm (\mathbf{c}' = 2\mathbf{c}) (22)$; $[2]\bar{4}ccm (\mathbf{c}' = 2\mathbf{c}) (21)$

Maximal isotypic subgroups and enantiomorphic subgroups of lowest index

IIc $[2]\bar{4}mmm (\mathbf{c}' = 2\mathbf{c}) (20)$

Minimal non-isotypic non-enantiomorphic supergroups

I $[2]\bar{4}4/mmm (39)$; $[2]\bar{4}4_2/mmc (41)$; $[3]\bar{4}6/mmm (73)$

II none