

$P\bar{4}m2$

D_{2d}^5

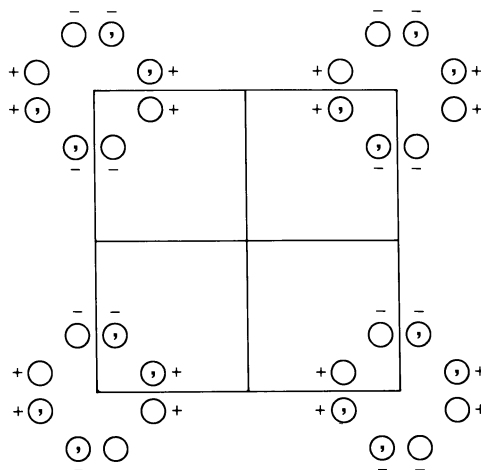
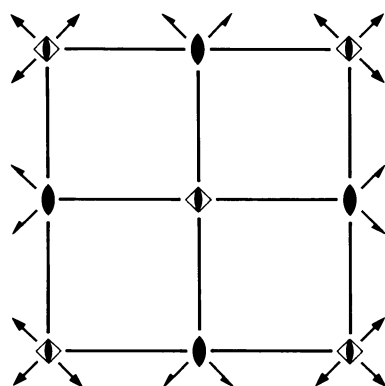
$\bar{4}m2$

Tetragonal

No. 115

$P\bar{4}m2$

Patterson symmetry $P4/mmm$



Origin at $\bar{4}m2$

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

Symmetry operations

- | | | | |
|-----------------|-----------------|-----------------------------------|-----------------------------------|
| (1) 1 | (2) 2 $0,0,z$ | (3) $\bar{4}^+$ $0,0,z$; $0,0,0$ | (4) $\bar{4}^-$ $0,0,z$; $0,0,0$ |
| (5) m $x,0,z$ | (6) m $0,y,z$ | (7) 2 $x,x,0$ | (8) 2 $x,\bar{x},0$ |

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

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	Reflection conditions
8 <i>l</i> 1	(1) x, y, z (5) x, \bar{y}, z (2) \bar{x}, \bar{y}, z (6) \bar{x}, y, z (3) y, \bar{x}, \bar{z} (7) y, x, \bar{z} (4) \bar{y}, x, \bar{z} (8) $\bar{y}, \bar{x}, \bar{z}$	General: no conditions Special:
4 <i>k</i> . <i>m</i> .	$x, \frac{1}{2}, z$ $\bar{x}, \frac{1}{2}, z$ $\frac{1}{2}, \bar{x}, \bar{z}$ $\frac{1}{2}, x, \bar{z}$	no extra conditions
4 <i>j</i> . <i>m</i> .	$x, 0, z$ $\bar{x}, 0, z$ $0, \bar{x}, \bar{z}$ $0, x, \bar{z}$	no extra conditions
4 <i>i</i> . . 2	$x, x, \frac{1}{2}$ $\bar{x}, \bar{x}, \frac{1}{2}$ $x, \bar{x}, \frac{1}{2}$ $\bar{x}, x, \frac{1}{2}$	no extra conditions
4 <i>h</i> . . 2	$x, x, 0$ $\bar{x}, \bar{x}, 0$ $x, \bar{x}, 0$ $\bar{x}, x, 0$	no extra conditions
2 <i>g</i> 2 <i>m m</i> .	$0, \frac{1}{2}, z$ $\frac{1}{2}, 0, \bar{z}$	$hk0 : h + k = 2n$
2 <i>f</i> 2 <i>m m</i> .	$\frac{1}{2}, \frac{1}{2}, z$ $\frac{1}{2}, \frac{1}{2}, \bar{z}$	no extra conditions
2 <i>e</i> 2 <i>m m</i> .	$0, 0, z$ $0, 0, \bar{z}$	no extra conditions
1 <i>d</i> $\bar{4}m2$	$0, 0, \frac{1}{2}$	no extra conditions
1 <i>c</i> $\bar{4}m2$	$\frac{1}{2}, \frac{1}{2}, \frac{1}{2}$	no extra conditions
1 <i>b</i> $\bar{4}m2$	$\frac{1}{2}, \frac{1}{2}, 0$	no extra conditions
1 <i>a</i> $\bar{4}m2$	$0, 0, 0$	no extra conditions

Symmetry of special projections

Along [001] $p4mm$
 $\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$
Origin at $0, 0, z$

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

Along [110] $p2mm$
 $\mathbf{a}' = \frac{1}{2}(-\mathbf{a} + \mathbf{b})$ $\mathbf{b}' = \mathbf{c}$
Origin at $x, x, 0$

Maximal non-isomorphic subgroups

I [2] $P\bar{4}11$ ($P\bar{4}$, 81) 1; 2; 3; 4
[2] $P2m1$ ($Pmm2$, 25) 1; 2; 5; 6
[2] $P212$ ($C222$, 21) 1; 2; 7; 8

IIa none

IIb [2] $P\bar{4}c2$ ($\mathbf{c}' = 2\mathbf{c}$) (116); [2] $C\bar{4}m2_1$ ($\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$) ($P\bar{4}2_1m$, 113); [2] $C\bar{4}m2$ ($\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$) ($P\bar{4}2m$, 111);
[2] $F\bar{4}m2$ ($\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}, \mathbf{c}' = 2\mathbf{c}$) ($I\bar{4}2m$, 121)

Maximal isomorphic subgroups of lowest index

IIc [2] $P\bar{4}m2$ ($\mathbf{c}' = 2\mathbf{c}$) (115); [9] $P\bar{4}m2$ ($\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$) (115)

Minimal non-isomorphic supergroups

I [2] $P4/mmm$ (123); [2] $P4/nmm$ (129); [2] $P4_2/mmc$ (131); [2] $P4_2/nmc$ (137)

II [2] $C\bar{4}m2$ ($P\bar{4}2m$, 111); [2] $I\bar{4}m2$ (119)