

$p4/m$

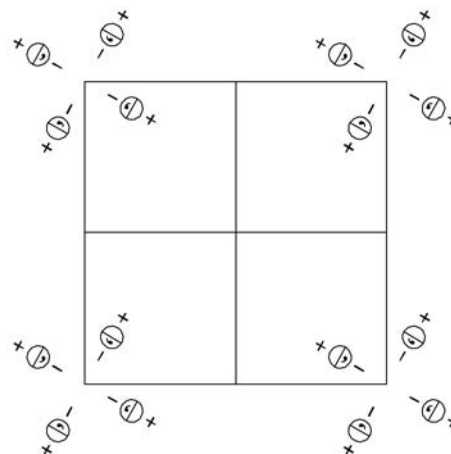
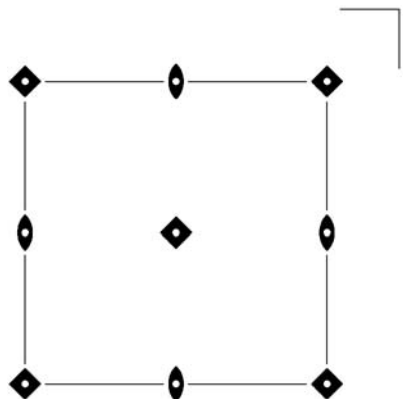
$4/m$

Tetragonal/Square

No. 51

$p4/m$

Patterson symmetry $p4/m$



Origin at centre ($4/m$)

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

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2_{z^2} 0,0,z
(2_z 0,0,0) | (3) 4^+ 0,0,z
(4_z^+ 0,0,0) | (4) 4^- 0,0,z
(4_z^- 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) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ 0,0,0) | (8) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ 0,0,0) |

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

Positions

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

Symmetry of special projections

Along $[001]$ $p4$
 $\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$
 Origin at $0, 0, z$

Along $[100]$ $\not\equiv 2mm$
 $\mathbf{a}' = \mathbf{b}$
 Origin at $x, 0, 0$

Along $[110]$ $\not\equiv 2mm$
 $\mathbf{a}' = \frac{1}{2}(-\mathbf{a} + \mathbf{b})$
 Origin at $x, x, 0$

Maximal non-isotypic subgroups

I $[2] p\bar{4} (50)$ 1; 2; 7; 8
 $[2] p4 (49)$ 1; 2; 3; 4
 $[2] p2/m11 (p112/m, 6)$ 1; 2; 5; 6

IIa none

IIb $[2] c4/a (\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}) (p4/n, 52)$

Maximal isotypic subgroups of lowest index

IIc $[2] c4/m (\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}) (p4/m, 51)$

Minimal non-isotypic supergroups

I $[2] p4/mmm (61)$; $[2] p4/mbm (63)$

II none