

$p\bar{4}b2$

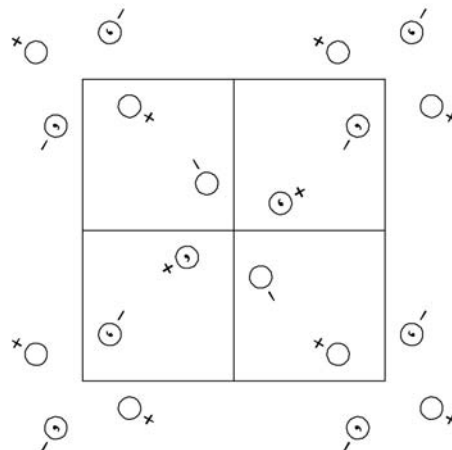
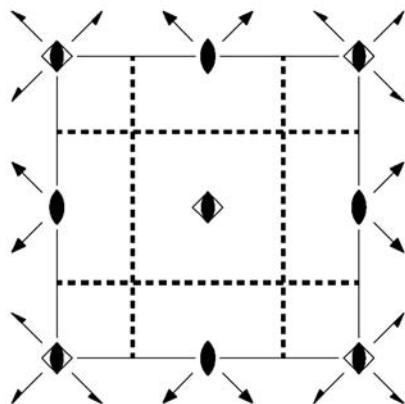
$\bar{4}m2$

Tetragonal/Square

No. 60

$p\bar{4}b2$

Patterson symmetry $p4/mmm$



Origin at $\bar{4}12_1$

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 $0,0,z$
(2_z 0,0,0) | (3) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) a $x, \frac{1}{4}, z$
(m_y $\frac{1}{2}, \frac{1}{2}, 0$) | (6) b $\frac{1}{4}, y, z$
(m_x $\frac{1}{2}, \frac{1}{2}, 0$) | (7) $2(\frac{1}{2}, \frac{1}{2}, 0)$ $x, x, 0$
(2_{xy} $\frac{1}{2}, \frac{1}{2}, 0$) | (8) 2 $x, \bar{x} + \frac{1}{2}, 0$
($2_{\bar{y}}$ $\frac{1}{2}, \frac{1}{2}, 0$) |

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

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				Reflection conditions
					General:
8 <i>f</i> 1	(1) x, y, z (5) $x + \frac{1}{2}, \bar{y} + \frac{1}{2}, z$	(2) \bar{x}, \bar{y}, z (6) $\bar{x} + \frac{1}{2}, y + \frac{1}{2}, z$	(3) y, \bar{x}, \bar{z} (7) $y + \frac{1}{2}, x + \frac{1}{2}, \bar{z}$	(4) \bar{y}, x, \bar{z} (8) $\bar{y} + \frac{1}{2}, \bar{x} + \frac{1}{2}, \bar{z}$	$h0: h = 2n$ $0k: k = 2n$
4 <i>e</i> .. 2	$x, x + \frac{1}{2}, 0$	$\bar{x}, \bar{x} + \frac{1}{2}, 0$	$x + \frac{1}{2}, \bar{x}, 0$	$\bar{x} + \frac{1}{2}, x, 0$	Special: as above, plus no extra conditions
4 <i>d</i> 2..	$0, \frac{1}{2}, z$	$\frac{1}{2}, 0, \bar{z}$	$\frac{1}{2}, 0, z$	$0, \frac{1}{2}, \bar{z}$	$hk: h + k = 2n$
4 <i>c</i> 2..	$0, 0, z$	$0, 0, \bar{z}$	$\frac{1}{2}, \frac{1}{2}, z$	$\frac{1}{2}, \frac{1}{2}, \bar{z}$	$hk: h + k = 2n$
2 <i>b</i> 2. 22	$0, \frac{1}{2}, 0$	$\frac{1}{2}, 0, 0$			$hk: h + k = 2n$
2 <i>a</i> $\bar{4}$..	$0, 0, 0$	$\frac{1}{2}, \frac{1}{2}, 0$			$hk: h + k = 2n$

Symmetry of special projections

Along [001] $p4gm$
 $\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$
 Origin at $0, 0, z$

Along [100] $\not\approx 1m1$
 $\mathbf{a}' = \frac{1}{2}\mathbf{b}$
 Origin at $x, 0, 0$

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

Maximal non-isotypic subgroups

I [2] $p\bar{4}11$ ($p\bar{4}$, 50) 1; 2; 3; 4
 [2] $p2b1$ ($pba2$, 25) 1; 2; 5; 6
 [2] $p212$ ($c222$, 22) 1; 2; 7; 8

IIa none

IIb none

Maximal isotypic subgroups of lowest index

IIc [9] $p\bar{4}b2$ ($\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$) (60)

Minimal non-isotypic supergroups

I [2] $p4/nbm$ (62); [2] $p4/mbm$ (63)

II [2] $c\bar{4}m2$ ($p\bar{4}2m$, 57)