

$p4bm$

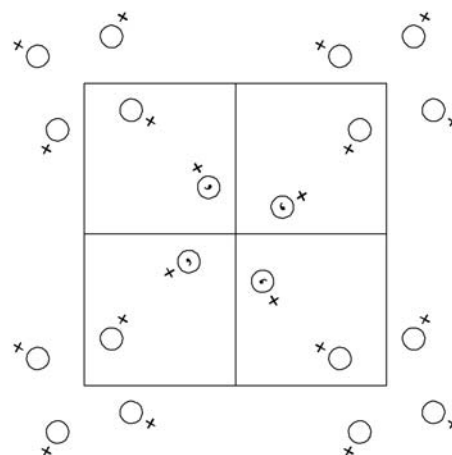
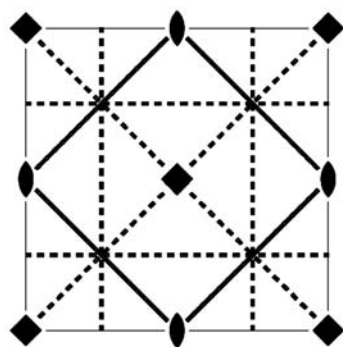
$4mm$

Tetragonal/Square

No. 56

$p4bm$

Patterson symmetry $p4/mmm$



Origin on 41g

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

Symmetry operations

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

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>d</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) \bar{y}, x, z (7) $\bar{y} + \frac{1}{2}, \bar{x} + \frac{1}{2}, z$	(4) y, \bar{x}, z (8) $y + \frac{1}{2}, x + \frac{1}{2}, z$	General: $0k: k = 2n$ $h0: h = 2n$ Special: as above, plus
4 <i>c</i> $\dots m$	$x, x + \frac{1}{2}, z$	$\bar{x}, \bar{x} + \frac{1}{2}, z$	$\bar{x} + \frac{1}{2}, x, z$	$x + \frac{1}{2}, \bar{x}, z$	no extra conditions
2 <i>b</i> $2 \dots mm$	$\frac{1}{2}, 0, z$	$0, \frac{1}{2}, z$			$hk: h + k = 2n$
2 <i>a</i> $4 \dots$	$0, 0, z$	$\frac{1}{2}, \frac{1}{2}, z$			$hk: h + k = 2n$

Symmetry of special projections

Along [001] $p4gm$

$\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$

Origin at $0, 0, z$

Along [100] $\cancel{1}m1$

$\mathbf{a}' = \frac{1}{2}\mathbf{b}$

Origin at $x, 0, 0$

Along [110] $\cancel{1}m1$

$\mathbf{a}' = \frac{1}{2}(-\mathbf{a} + \mathbf{b})$

Origin at $x, x, 0$

Maximal non-isotypic subgroups

I	[2] $p411$ ($p4, 49$)	1; 2; 3; 4
	[2] $p21m$ ($cmm2, 26$)	1; 2; 7; 8
	[2] $p2b1$ ($pba2, 25$)	1; 2; 5; 6

IIa none

IIb none

Maximal isotypic subgroups of lowest index

IIc [9] $p4bm$ ($\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$) (56)

Minimal non-isotypic supergroups

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

II [2] $c4mm$ ($p4mm, 55$)