

$p4mm$

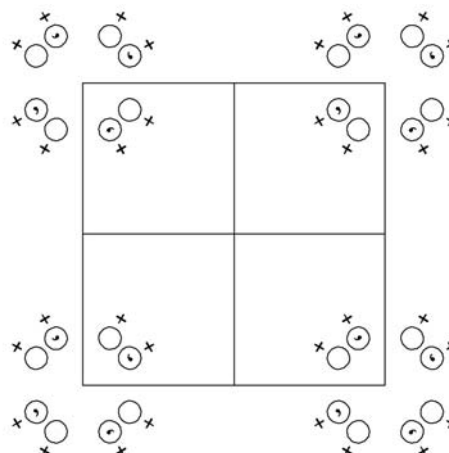
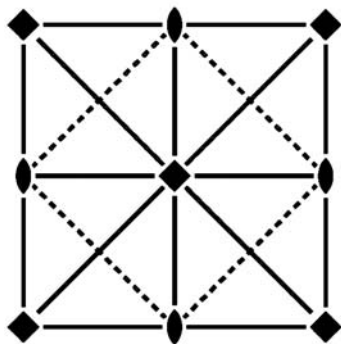
$4mm$

Tetragonal/Square

No. 55

$p4mm$

Patterson symmetry $p4/mmm$



Origin on $4mm$

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

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 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) m x,0,z
(m _y 0,0,0) | (6) m 0,y,z
(m _x 0,0,0) | (7) m x, \bar{x} ,z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{\bar{xy}} 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	g 1	(1) x, y, z (5) x, \bar{y}, z	(2) \bar{x}, \bar{y}, z (6) \bar{x}, y, z	(3) \bar{y}, x, z (7) \bar{y}, \bar{x}, z	(4) y, \bar{x}, z (8) y, x, z	General: no conditions Special:
4	f . m .	$x, \frac{1}{2}, z$	$\bar{x}, \frac{1}{2}, z$	$\frac{1}{2}, x, z$	$\frac{1}{2}, \bar{x}, z$	no extra conditions
4	e . m .	$x, 0, z$	$\bar{x}, 0, z$	$0, x, z$	$0, \bar{x}, z$	no extra conditions
4	d . . m	x, x, z	\bar{x}, \bar{x}, z	\bar{x}, x, z	x, \bar{x}, z	no extra conditions
2	c 2 mm .	$\frac{1}{2}, 0, z$	$0, \frac{1}{2}, z$			$hk: h+k=2n$
1	b 4 $m m$	$\frac{1}{2}, \frac{1}{2}, z$				no extra conditions
1	a 4 $m m$	$0, 0, z$				no extra conditions

Symmetry of special projections

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

Along $[100]$ $\neq 1m1$
 $\mathbf{a}' = \mathbf{b}$
 Origin at $x, 0, 0$

Along $[110]$ $\neq 1m1$
 $\mathbf{a}' = \frac{1}{2}(-\mathbf{a} + \mathbf{b})$
 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] $p2m1$ ($pmm2, 23$) 1; 2; 5; 6

IIa none

IIb [2] $c4md$ ($\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$) ($p4bm, 56$)

Maximal isotypic subgroups of lowest index

IIc [2] $c4mm$ ($\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$) ($p4mm, 55$)

Minimal non-isotypic supergroups

I [2] $p4/mmm$ (61); [2] $p4/nmm$ (64)

II none