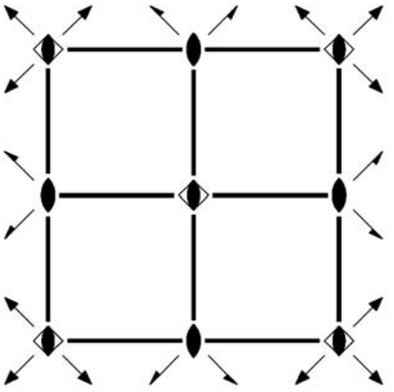
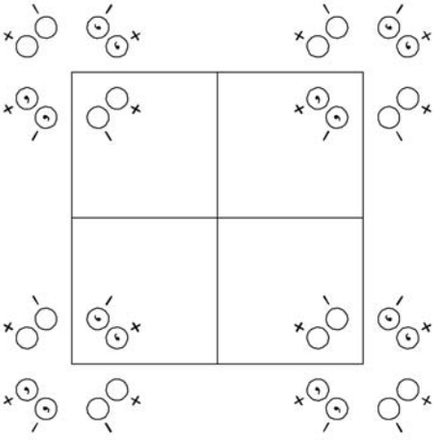
International Tables for Crystallography (2006). Vol. E, Layer group 59, pp. 342–343.

$p\bar{4}m2$ $\bar{4}m2$ Tetragonal/Square

No. 59 $p\bar{4}m2$

Patterson symmetry $p4/mmm$





Origin at $\bar{4}m2$

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

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

Positions

Multiplicity, Wyckoff letter, Site symmetry			Coordinates				Reflection conditions
							General:
8	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) $\bar{y},\bar{x},\bar{z}$	no conditions
							Special:
4	h	. m .	$x,\frac{1}{2},z$	$\bar{x},\frac{1}{2},z$	$\frac{1}{2},\bar{x},\bar{z}$	$\frac{1}{2},x,\bar{z}$	no extra conditions
4	g	. m .	$x,0,z$	$\bar{x},0,z$	$0,\bar{x},\bar{z}$	$0,x,\bar{z}$	no extra conditions
4	f	. . 2	$x,x,0$	$\bar{x},\bar{x},0$	$x,\bar{x},0$	$\bar{x},x,0$	no extra conditions
2	e	2 mm .	$0,\frac{1}{2},z$	$\frac{1}{2},0,\bar{z}$			hk: $h+k=2n$
2	d	2 mm .	$\frac{1}{2},\frac{1}{2},z$	$\frac{1}{2},\frac{1}{2},\bar{z}$			no extra conditions
2	c	2 mm .	$0,0,z$	$0,0,\bar{z}$			no extra conditions
1	b	$\bar{4}$ m 2	$\frac{1}{2},\frac{1}{2},0$				no extra conditions
1	a	$\bar{4}$ m 2	$0,0,0$				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] $\not\!/\, 1m1$
$\mathbf{a}' = \mathbf{b}$
Origin at $x,0,0$

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

Maximal non-isotypic subgroups

I [2] $p\bar{4}11$ ($p\bar{4}$, 50) 1; 2; 3; 4
[2] $p2m1$ ($pmm2$, 23) 1; 2; 5; 6
[2] $p212$ ($c222$, 22) 1; 2; 7; 8

IIa none

IIb [2] $c\bar{4}m2_1$ ($\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$) ($p\bar{4}2_1m$, 58); [2] $c\bar{4}m2$ ($\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$) ($p\bar{4}2m$, 57)

Maximal isotypic subgroups of lowest index

IIc [9] $p\bar{4}m2$ ($\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$) (59)

Minimal non-isotypic supergroups

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

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