

$p\bar{4}$

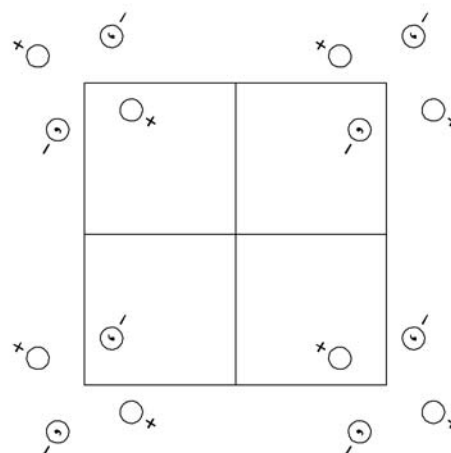
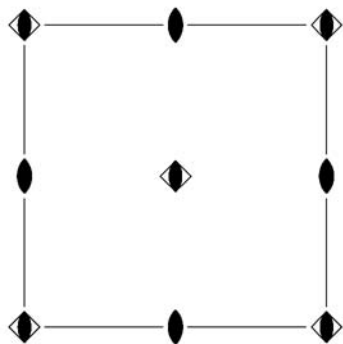
$\bar{4}$

Tetragonal/Square

No. 50

$p\bar{4}$

Patterson symmetry  $p4/m$



Origin at  $\bar{4}$

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

Symmetry operations

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

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

**Positions**

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				Reflection conditions
					General: Special:
4 <i>f</i> 1	(1) $x, y, z$	(2) $\bar{x}, \bar{y}, z$	(3) $y, \bar{x}, \bar{z}$	(4) $\bar{y}, x, \bar{z}$	no conditions Special: $hk: h+k=2n$
2 <i>e</i> 2..	$0, \frac{1}{2}, z$	$\frac{1}{2}, 0, \bar{z}$			no extra conditions
2 <i>d</i> 2..	$\frac{1}{2}, \frac{1}{2}, z$	$\frac{1}{2}, \frac{1}{2}, \bar{z}$			no extra conditions
2 <i>c</i> 2..	$0, 0, z$	$0, 0, \bar{z}$			no extra conditions
1 <i>b</i> $\bar{4}$ ..	$\frac{1}{2}, \frac{1}{2}, 0$				no extra conditions
1 <i>a</i> $\bar{4}$ ..	$0, 0, 0$				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]  $\neq 1m1$   
 $\mathbf{a}' = \mathbf{b}$   
 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]  $p211(p112, 3)$  1; 2

**IIa** none

**IIb** none

**Maximal isotypic subgroups of lowest index**

**IIc** [2]  $c\bar{4}(\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b})(p\bar{4}, 50)$

**Minimal non-isotypic supergroups**

**I** [2]  $p4/m(51)$ ; [2]  $p4/n(52)$ ; [2]  $p\bar{4}2m(57)$ ; [2]  $p\bar{4}2_1m(58)$ ; [2]  $p\bar{4}m2(59)$ ; [2]  $p\bar{4}b2(60)$

**II** none