

$I4cm$

C_{4v}^{10}

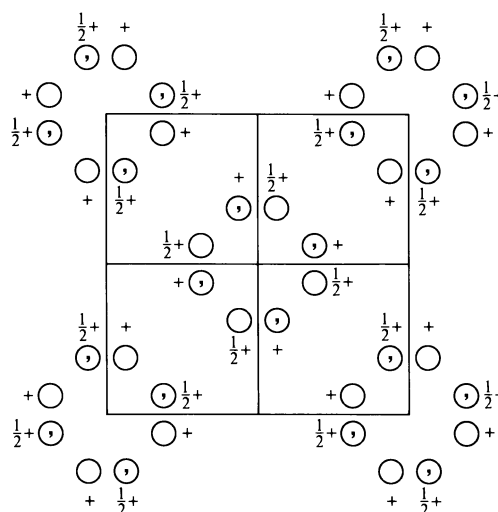
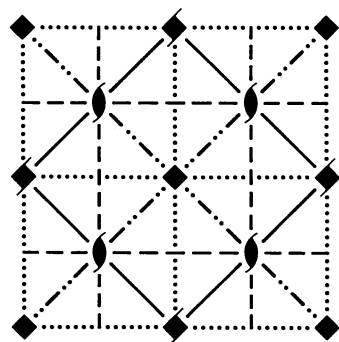
$4mm$

Tetragonal

No. 108

$I4cm$

Patterson symmetry $I4/mmm$



Origin on $4c$

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

Symmetry operations

For $(0,0,0)+$ set

- (1) 1
- (2) 2 $0,0,z$
- (3) 4^+ $0,0,z$
- (4) 4^- $0,0,z$
- (5) c $x,0,z$
- (6) c $0,y,z$
- (7) c x,\bar{x},z
- (8) c x,x,z

For $(\frac{1}{2},\frac{1}{2},\frac{1}{2})+$ set

- (1) $t(\frac{1}{2},\frac{1}{2},\frac{1}{2})$
- (2) $2(0,0,\frac{1}{2})$ $\frac{1}{4},\frac{1}{4},z$
- (3) $4^+(0,0,\frac{1}{2})$ $0,\frac{1}{2},z$
- (4) $4^-(0,0,\frac{1}{2})$ $\frac{1}{2},0,z$
- (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); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(\frac{1}{2},\frac{1}{2},\frac{1}{2})$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	Reflection conditions
	$(0,0,0)+$ $(\frac{1}{2},\frac{1}{2},\frac{1}{2})+$	General:
16 d 1	(1) x,y,z (2) \bar{x},\bar{y},z (3) \bar{y},x,z (4) y,\bar{x},z (5) $x,\bar{y},z+\frac{1}{2}$ (6) $\bar{x},y,z+\frac{1}{2}$ (7) $\bar{y},\bar{x},z+\frac{1}{2}$ (8) $y,x,z+\frac{1}{2}$	$hkl: h+k+l=2n$ $hk0: h+k=2n$ $0kl: k,l=2n$ $hhl: l=2n$ $00l: l=2n$ $h00: h=2n$
8 c $..m$	$x,x+\frac{1}{2},z$ $\bar{x},\bar{x}+\frac{1}{2},z$ $\bar{x}+\frac{1}{2},x,z$ $x+\frac{1}{2},\bar{x},z$	Special: as above, plus no extra conditions
4 b $2.mm$	$\frac{1}{2},0,z$ $0,\frac{1}{2},z$	$hkl: l=2n$
4 a $4..$	$0,0,z$ $0,0,z+\frac{1}{2}$	$hkl: l=2n$

Symmetry of special projections

Along $[001]$ $p4mm$

$\mathbf{a}' = \frac{1}{2}(\mathbf{a} - \mathbf{b})$ $\mathbf{b}' = \frac{1}{2}(\mathbf{a} + \mathbf{b})$
Origin at $0,0,z$

Along $[100]$ $p1m1$

$\mathbf{a}' = \frac{1}{2}\mathbf{b}$ $\mathbf{b}' = \frac{1}{2}\mathbf{c}$
Origin at $x,0,0$

Along $[110]$ $p1m1$

$\mathbf{a}' = \frac{1}{2}(-\mathbf{a} + \mathbf{b})$ $\mathbf{b}' = \frac{1}{2}\mathbf{c}$
Origin at $x,x,0$