

$P\bar{4}2c$

$D_{2d}^2$

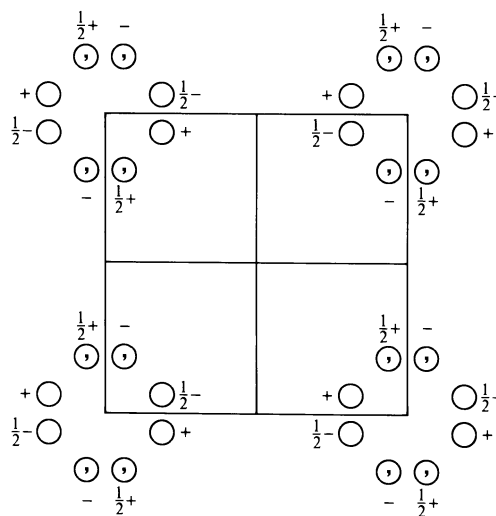
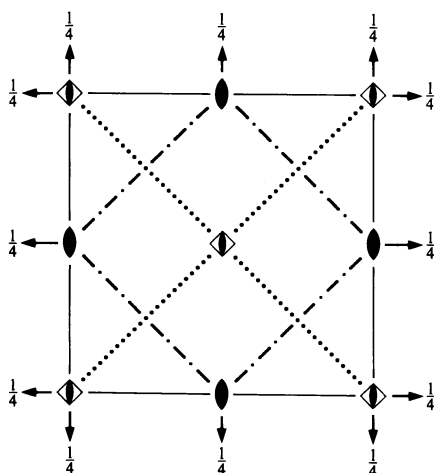
$\bar{4}2m$

Tetragonal

No. 112

$P\bar{4}2c$

Patterson symmetry  $P4/mmm$



Origin at  $\bar{4}1c$

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

Symmetry operations

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

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

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	Reflection conditions
8 <i>n</i> 1	(1) $x,y,z$ (5) $\bar{x},y,\bar{z}+\frac{1}{2}$ (2) $\bar{x},\bar{y},z$ (6) $x,\bar{y},\bar{z}+\frac{1}{2}$ (3) $y,\bar{x},\bar{z}$ (7) $\bar{y},\bar{x},z+\frac{1}{2}$ (4) $\bar{y},x,\bar{z}$ (8) $y,x,z+\frac{1}{2}$	General: $hhl: l = 2n$ $00l: l = 2n$ Special: as above, plus $hkl: h+k+l = 2n$ $hkl: l = 2n$ $hkl: l = 2n$ no extra conditions no extra conditions no extra conditions no extra conditions $hkl: l = 2n$ $hkl: l = 2n$ $hkl: h+k+l = 2n$ $hkl: l = 2n$ $hkl: h+k+l = 2n$ $hkl: l = 2n$
4 <i>m</i> 2..	$0, \frac{1}{2}, z$ $\frac{1}{2}, 0, \bar{z}$ $0, \frac{1}{2}, \bar{z} + \frac{1}{2}$ $\frac{1}{2}, 0, z + \frac{1}{2}$	
4 <i>l</i> 2..	$\frac{1}{2}, \frac{1}{2}, z$ $\frac{1}{2}, \frac{1}{2}, \bar{z}$ $\frac{1}{2}, \frac{1}{2}, \bar{z} + \frac{1}{2}$ $\frac{1}{2}, \frac{1}{2}, z + \frac{1}{2}$	
4 <i>k</i> 2..	$0, 0, z$ $0, 0, \bar{z}$ $0, 0, \bar{z} + \frac{1}{2}$ $0, 0, z + \frac{1}{2}$	
4 <i>j</i> .2.	$0, y, \frac{1}{4}$ $0, \bar{y}, \frac{1}{4}$ $y, 0, \frac{3}{4}$ $\bar{y}, 0, \frac{3}{4}$	no extra conditions
4 <i>i</i> .2.	$x, \frac{1}{2}, \frac{1}{4}$ $\bar{x}, \frac{1}{2}, \frac{1}{4}$ $\frac{1}{2}, \bar{x}, \frac{3}{4}$ $\frac{1}{2}, x, \frac{3}{4}$	no extra conditions
4 <i>h</i> .2.	$\frac{1}{2}, y, \frac{1}{4}$ $\frac{1}{2}, \bar{y}, \frac{1}{4}$ $y, \frac{1}{2}, \frac{3}{4}$ $\bar{y}, \frac{1}{2}, \frac{3}{4}$	no extra conditions
4 <i>g</i> .2.	$x, 0, \frac{1}{4}$ $\bar{x}, 0, \frac{1}{4}$ $0, \bar{x}, \frac{3}{4}$ $0, x, \frac{3}{4}$	no extra conditions
2 <i>f</i> $\bar{4}$ ..	$\frac{1}{2}, \frac{1}{2}, 0$ $\frac{1}{2}, \frac{1}{2}, \frac{1}{2}$	$hkl: l = 2n$
2 <i>e</i> $\bar{4}$ ..	$0, 0, 0$ $0, 0, \frac{1}{2}$	$hkl: l = 2n$
2 <i>d</i> 222.	$0, \frac{1}{2}, \frac{1}{4}$ $\frac{1}{2}, 0, \frac{3}{4}$	$hkl: h+k+l = 2n$
2 <i>c</i> 222.	$\frac{1}{2}, \frac{1}{2}, \frac{1}{4}$ $\frac{1}{2}, \frac{1}{2}, \frac{3}{4}$	$hkl: l = 2n$
2 <i>b</i> 222.	$\frac{1}{2}, 0, \frac{1}{4}$ $0, \frac{1}{2}, \frac{3}{4}$	$hkl: h+k+l = 2n$
2 <i>a</i> 222.	$0, 0, \frac{1}{4}$ $0, 0, \frac{3}{4}$	$hkl: l = 2n$

Symmetry of special projections

Along [001]  $p4mm$

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

Origin at  $0,0,z$

Along [100]  $p2mm$

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

Origin at  $x,0,\frac{1}{4}$

Along [110]  $p1m1$

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

Origin at  $x,x,0$