

$I\bar{4}c2$

D_{2d}^{10}

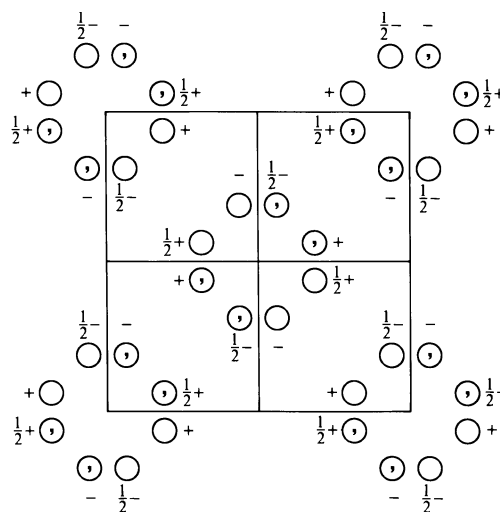
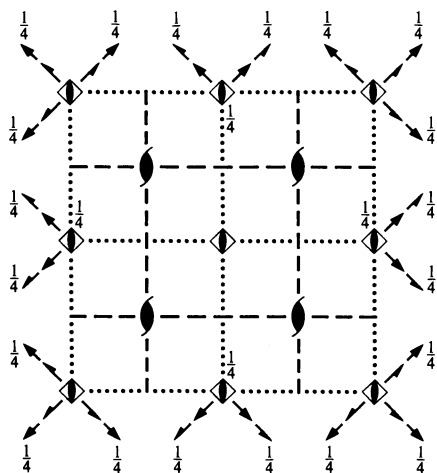
$\bar{4}m2$

Tetragonal

No. 120

$I\bar{4}c2$

Patterson symmetry $I4/mmm$



Origin at $\bar{4}c2_1$

Asymmetric unit $0 \leq x \leq \frac{1}{2}; 0 \leq y \leq \frac{1}{2}; 0 \leq z \leq \frac{1}{4}$

Symmetry operations

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

- | | | | |
|-----------------|-----------------|--------------------------------|--------------------------------|
| (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) c $x,0,z$ | (6) c $0,y,z$ | (7) 2 $x,x,\frac{1}{4}$ | (8) 2 $x,\bar{x},\frac{1}{4}$ |

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

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

$(0,0,0) + (\frac{1}{2}, \frac{1}{2}, \frac{1}{2}) +$

Reflection conditions

General:

16 *i* 1 (1) x, y, z (2) \bar{x}, \bar{y}, z (3) y, \bar{x}, \bar{z} (4) \bar{y}, x, \bar{z}
(5) $x, \bar{y}, z + \frac{1}{2}$ (6) $\bar{x}, y, z + \frac{1}{2}$ (7) $y, x, \bar{z} + \frac{1}{2}$ (8) $\bar{y}, \bar{x}, \bar{z} + \frac{1}{2}$

$hkl: h + k + l = 2n$

$hk0: h + k = 2n$

$0kl: k, l = 2n$

$hhl: l = 2n$

$00l: l = 2n$

$h00: h = 2n$

Special: as above, plus

no extra conditions

$hkl: l = 2n$

$hkl: l = 2n$

no extra conditions

$hkl: l = 2n$

$hkl: l = 2n$

$hkl: l = 2n$

$hkl: l = 2n$

8 *h* ..2 $x, x + \frac{1}{2}, 0$ $\bar{x}, \bar{x} + \frac{1}{2}, 0$ $x + \frac{1}{2}, \bar{x}, 0$ $\bar{x} + \frac{1}{2}, x, 0$

8 *g* 2.. $0, \frac{1}{2}, z$ $\frac{1}{2}, 0, \bar{z}$ $0, \frac{1}{2}, z + \frac{1}{2}$ $\frac{1}{2}, 0, \bar{z} + \frac{1}{2}$

8 *f* 2.. $0, 0, z$ $0, 0, \bar{z}$ $0, 0, z + \frac{1}{2}$ $0, 0, \bar{z} + \frac{1}{2}$

8 *e* ..2 $x, x, \frac{1}{4}$ $\bar{x}, \bar{x}, \frac{1}{4}$ $x, \bar{x}, \frac{3}{4}$ $\bar{x}, x, \frac{3}{4}$

4 *d* 2.22 $0, \frac{1}{2}, 0$ $\frac{1}{2}, 0, 0$

4 *c* $\bar{4}$.. $0, \frac{1}{2}, \frac{1}{4}$ $0, \frac{1}{2}, \frac{3}{4}$

4 *b* $\bar{4}$.. $0, 0, 0$ $0, 0, \frac{1}{2}$

4 *a* 2.22 $0, 0, \frac{1}{4}$ $0, 0, \frac{3}{4}$

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 $[110]$ $p2mm$

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

Origin at $x, x, 0$