

$F 222$

D_2^7

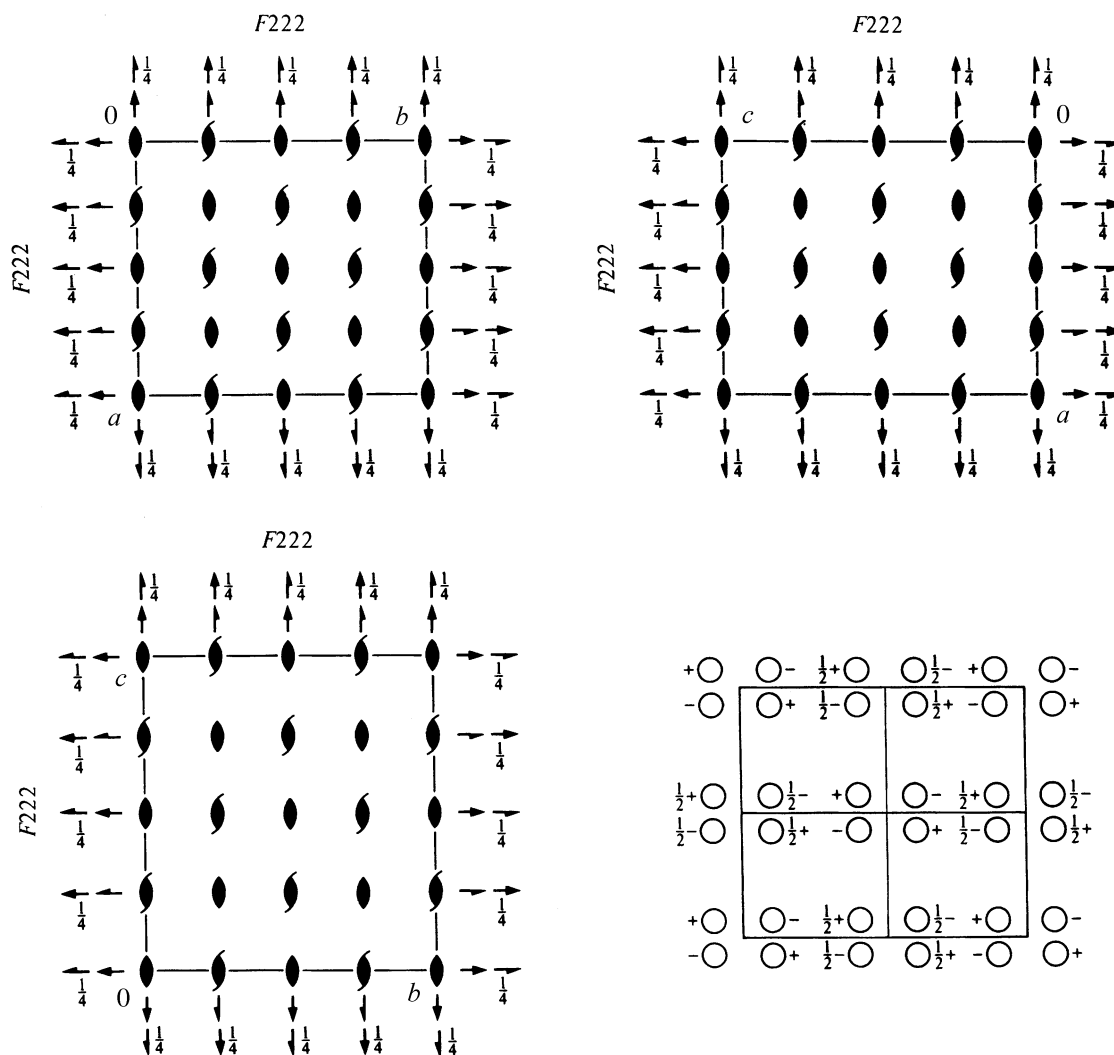
222

Orthorhombic

No. 22

$F 222$

Patterson symmetry $F m m m$



Origin at 222

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

Symmetry operations

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

- (1) 1
- (2) 2 $0,0,z$
- (3) 2 $0,y,0$
- (4) 2 $x,0,0$

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

- (1) $t(0, \frac{1}{2}, \frac{1}{2})$
- (2) 2 $(0,0, \frac{1}{2}) 0, \frac{1}{4}, z$
- (3) 2 $(0, \frac{1}{2}, 0) 0, y, \frac{1}{4}$
- (4) 2 $x, \frac{1}{4}, \frac{1}{4}$

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

- (1) $t(\frac{1}{2}, 0, \frac{1}{2})$
- (2) 2 $(0,0, \frac{1}{2}) \frac{1}{4}, 0, z$
- (3) 2 $\frac{1}{4}, y, \frac{1}{4}$
- (4) 2 $(\frac{1}{2}, 0, 0) x, 0, \frac{1}{4}$

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

- (1) $t(\frac{1}{2}, \frac{1}{2}, 0)$
- (2) 2 $\frac{1}{4}, \frac{1}{4}, z$
- (3) 2 $(0, \frac{1}{2}, 0) \frac{1}{4}, y, 0$
- (4) 2 $(\frac{1}{2}, 0, 0) x, \frac{1}{4}, 0$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(0, \frac{1}{2}, \frac{1}{2})$; $t(\frac{1}{2}, 0, \frac{1}{2})$; (2); (3)

Positions

Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

Reflection conditions

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

General:

16 *k* 1 (1) x, y, z (2) \bar{x}, \bar{y}, z (3) \bar{x}, y, \bar{z} (4) x, \bar{y}, \bar{z}

 $hkl: h+k, h+l, k+l = 2n$ $0kl: k, l = 2n$ $h0l: h, l = 2n$ $hk0: h, k = 2n$ $h00: h = 2n$ $0k0: k = 2n$ $00l: l = 2n$

Special: no extra conditions

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

8 *i* .2. $\frac{1}{4}, y, \frac{1}{4}$ $\frac{3}{4}, \bar{y}, \frac{1}{4}$

8 *h* ..2 $\frac{1}{4}, \frac{1}{4}, z$ $\frac{3}{4}, \frac{1}{4}, \bar{z}$

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

8 *f* .2. $0, y, 0$ $0, \bar{y}, 0$

8 *e* 2.. $x, 0, 0$ $\bar{x}, 0, 0$

4 *d* 222 $\frac{1}{4}, \frac{1}{4}, \frac{3}{4}$

4 *c* 222 $\frac{1}{4}, \frac{1}{4}, \frac{1}{4}$

4 *b* 222 $0, 0, \frac{1}{2}$

4 *a* 222 $0, 0, 0$

Symmetry of special projectionsAlong [001] $p2mm$ $\mathbf{a}' = \frac{1}{2}\mathbf{a}$ $\mathbf{b}' = \frac{1}{2}\mathbf{b}$

Origin at 0, 0, z

Along [100] $p2mm$ $\mathbf{a}' = \frac{1}{2}\mathbf{b}$ $\mathbf{b}' = \frac{1}{2}\mathbf{c}$

Origin at x, 0, 0

Along [010] $p2mm$ $\mathbf{a}' = \frac{1}{2}\mathbf{c}$ $\mathbf{b}' = \frac{1}{2}\mathbf{a}$

Origin at 0, y, 0