

$P2_13$

T^4

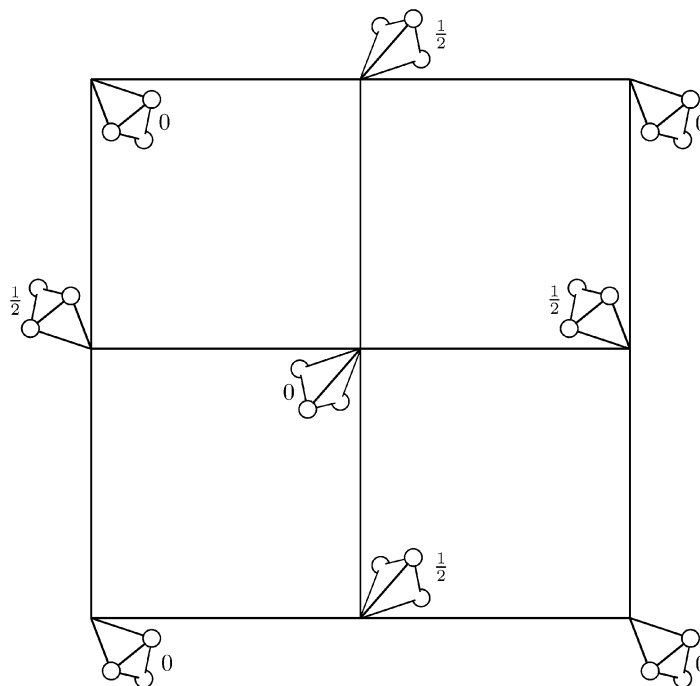
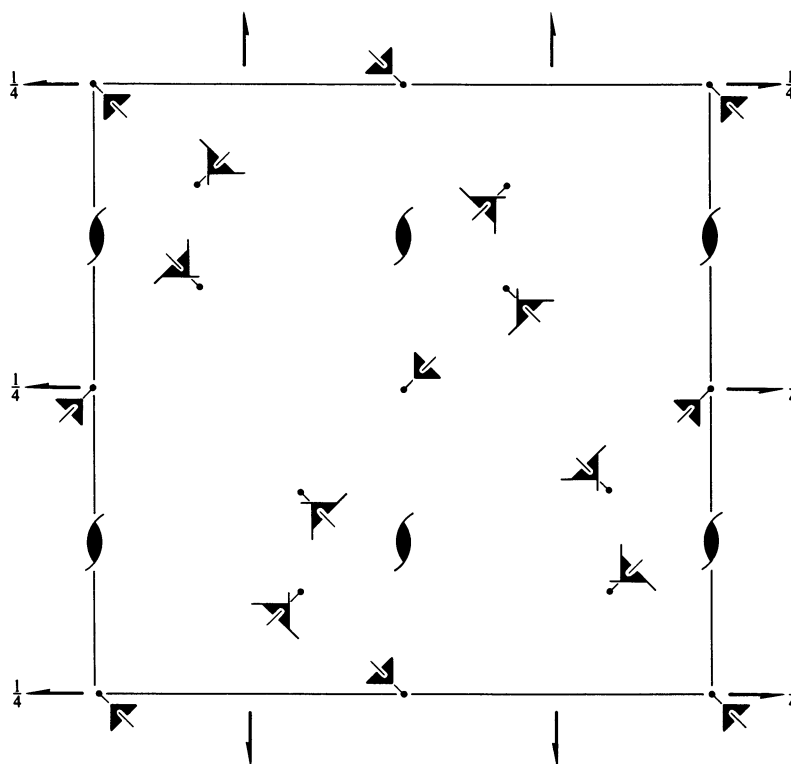
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Cubic

No. 198

$P2_13$

Patterson symmetry $Pm\bar{3}$



Origin on $3[111]$ at midpoint of three non-intersecting pairs of parallel 2_1 axes

Asymmetric unit $0 \leq x \leq \frac{1}{2}; 0 \leq y \leq \frac{1}{2}; -\frac{1}{2} \leq z \leq \frac{1}{2}; \max(x - \frac{1}{2}, -y) \leq z \leq \min(x, y)$

Vertices $0, 0, 0 \quad \frac{1}{2}, 0, 0 \quad \frac{1}{2}, \frac{1}{2}, 0 \quad 0, \frac{1}{2}, 0 \quad \frac{1}{2}, \frac{1}{2}, \frac{1}{2} \quad 0, \frac{1}{2}, -\frac{1}{2}$

Symmetry operations

- (1) 1
- (2) $2(0, 0, \frac{1}{2}) \quad \frac{1}{4}, 0, z$
- (3) $2(0, \frac{1}{2}, 0) \quad 0, y, \frac{1}{4}$
- (4) $2(\frac{1}{2}, 0, 0) \quad x, \frac{1}{4}, 0$
- (5) $3^+ \quad x, x, x$
- (6) $3^+ \quad \bar{x} + \frac{1}{2}, x, \bar{x}$
- (7) $3^+ \quad x + \frac{1}{2}, \bar{x} - \frac{1}{2}, \bar{x}$
- (8) $3^+ \quad \bar{x}, \bar{x} + \frac{1}{2}, x$
- (9) $3^- \quad x, x, x$
- (10) $3^- \quad (-\frac{1}{3}, \frac{1}{3}, \frac{1}{3}) \quad x + \frac{1}{6}, \bar{x} + \frac{1}{6}, \bar{x}$
- (11) $3^- \quad (\frac{1}{3}, \frac{1}{3}, -\frac{1}{3}) \quad \bar{x} + \frac{1}{3}, \bar{x} + \frac{1}{6}, x$
- (12) $3^- \quad (\frac{1}{3}, -\frac{1}{3}, \frac{1}{3}) \quad \bar{x} - \frac{1}{6}, x + \frac{1}{3}, \bar{x}$

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

h, k, l cyclically permutable

General:

12	b	1	(1) x, y, z	(2) $\bar{x} + \frac{1}{2}, \bar{y}, z + \frac{1}{2}$	(3) $\bar{x}, y + \frac{1}{2}, \bar{z} + \frac{1}{2}$	(4) $x + \frac{1}{2}, \bar{y} + \frac{1}{2}, \bar{z}$	$h00: h = 2n$
			(5) z, x, y	(6) $z + \frac{1}{2}, \bar{x} + \frac{1}{2}, \bar{y}$	(7) $\bar{z} + \frac{1}{2}, \bar{x}, y + \frac{1}{2}$	(8) $\bar{z}, x + \frac{1}{2}, \bar{y} + \frac{1}{2}$	
			(9) y, z, x	(10) $\bar{y}, z + \frac{1}{2}, \bar{x} + \frac{1}{2}$	(11) $y + \frac{1}{2}, \bar{z} + \frac{1}{2}, \bar{x}$	(12) $\bar{y} + \frac{1}{2}, \bar{z}, x + \frac{1}{2}$	

Special: no extra conditions

4	a	.3.	x, x, x	$\bar{x} + \frac{1}{2}, \bar{x}, x + \frac{1}{2}$	$\bar{x}, x + \frac{1}{2}, \bar{x} + \frac{1}{2}$	$x + \frac{1}{2}, \bar{x} + \frac{1}{2}, \bar{x}$
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Symmetry of special projections

Along [001] $p2gg$

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

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

Along [111] $p3$

$\mathbf{a}' = \frac{1}{3}(2\mathbf{a} - \mathbf{b} - \mathbf{c})$

Origin at x, x, x

$\mathbf{b}' = \frac{1}{3}(-\mathbf{a} + 2\mathbf{b} - \mathbf{c})$

Along [110] $p1g1$

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

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