

Trigonal

$\bar{3}m1$

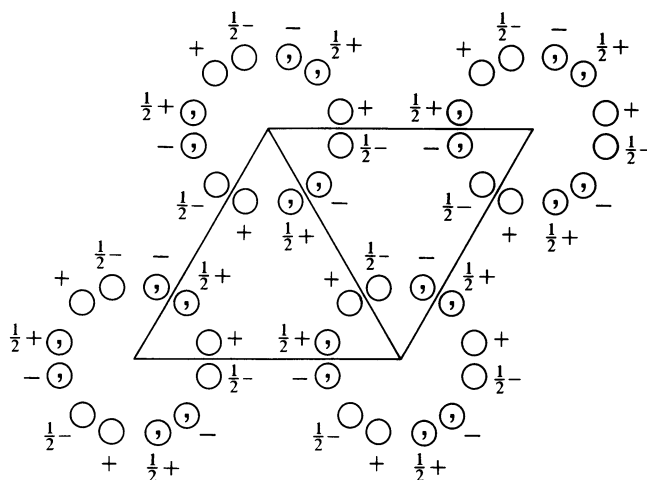
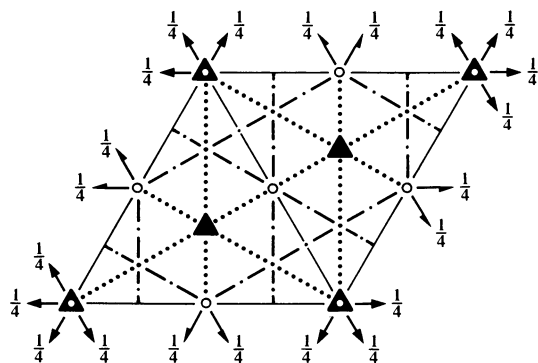
D_{3d}^4

$P\bar{3}c1$

Patterson symmetry $P\bar{3}m1$

$P\bar{3}2/c1$

No. 165



Origin at centre ($\bar{3}$) at $\bar{3}c1$

Asymmetric unit $0 \leq x \leq \frac{2}{3}; 0 \leq y \leq \frac{2}{3}; 0 \leq z \leq \frac{1}{4}; x \leq (1+y)/2; y \leq \min(1-x, (1+x)/2)$
Vertices $0,0,0 \quad \frac{1}{2},0,0 \quad \frac{2}{3},\frac{1}{3},0 \quad \frac{1}{3},\frac{2}{3},0 \quad 0,\frac{1}{2},0$
 $0,0,\frac{1}{4} \quad \frac{1}{2},0,\frac{1}{4} \quad \frac{2}{3},\frac{1}{3},\frac{1}{4} \quad \frac{1}{3},\frac{2}{3},\frac{1}{4} \quad 0,\frac{1}{2},\frac{1}{4}$

Symmetry operations

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

Generators selected (1); $t(1,0,0); t(0,1,0); t(0,0,1); (2); (4); (7)$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	Reflection conditions
12 <i>g</i> 1	(1) x,y,z (2) $\bar{y},x-y,z$ (3) $\bar{x}+y,\bar{x},z$ (4) $y,x,\bar{z}+\frac{1}{2}$ (5) $x-y,\bar{y},\bar{z}+\frac{1}{2}$ (6) $\bar{x},\bar{x}+y,\bar{z}+\frac{1}{2}$ (7) \bar{x},\bar{y},\bar{z} (8) $y,\bar{x}+y,\bar{z}$ (9) $x-y,x,\bar{z}$ (10) $\bar{y},\bar{x},z+\frac{1}{2}$ (11) $\bar{x}+y,y,z+\frac{1}{2}$ (12) $x,x-y,z+\frac{1}{2}$	General: $h\bar{h}0l: l = 2n$ $000l: l = 2n$
6 <i>f</i> .2.	$x,0,\frac{1}{4} \quad 0,x,\frac{1}{4} \quad \bar{x},\bar{x},\frac{1}{4} \quad \bar{x},0,\frac{3}{4} \quad 0,\bar{x},\frac{3}{4} \quad x,x,\frac{3}{4}$	Special: as above, plus no extra conditions
6 <i>e</i> $\bar{1}$	$\frac{1}{2},0,0 \quad 0,\frac{1}{2},0 \quad \frac{1}{2},\frac{1}{2},0 \quad 0,\frac{1}{2},\frac{1}{2} \quad \frac{1}{2},0,\frac{1}{2} \quad \frac{1}{2},\frac{1}{2},\frac{1}{2}$	$hkil: l = 2n$
4 <i>d</i> 3..	$\frac{1}{3},\frac{2}{3},z \quad \frac{2}{3},\frac{1}{3},\bar{z}+\frac{1}{2} \quad \frac{2}{3},\frac{1}{3},\bar{z} \quad \frac{1}{3},\frac{2}{3},z+\frac{1}{2}$	$hkil: l = 2n$
4 <i>c</i> 3..	$0,0,z \quad 0,0,\bar{z}+\frac{1}{2} \quad 0,0,\bar{z} \quad 0,0,z+\frac{1}{2}$	$hkil: l = 2n$
2 <i>b</i> $\bar{3}$..	$0,0,0 \quad 0,0,\frac{1}{2}$	$hkil: l = 2n$
2 <i>a</i> 32.	$0,0,\frac{1}{4} \quad 0,0,\frac{3}{4}$	$hkil: l = 2n$

Symmetry of special projections

Along $[001] p6mm$ $\mathbf{a}' = \mathbf{a} \quad \mathbf{b}' = \mathbf{b}$ Along $[100] p2$ $\mathbf{a}' = \frac{1}{2}(\mathbf{a} + 2\mathbf{b}) \quad \mathbf{b}' = \frac{1}{2}\mathbf{c}$ Along $[210] p2gm$ $\mathbf{a}' = \frac{1}{2}\mathbf{b} \quad \mathbf{b}' = \mathbf{c}$
 Origin at $0,0,z$ Origin at $x,0,0$ Origin at $x,\frac{1}{2}x,0$