

P312

D_3^1

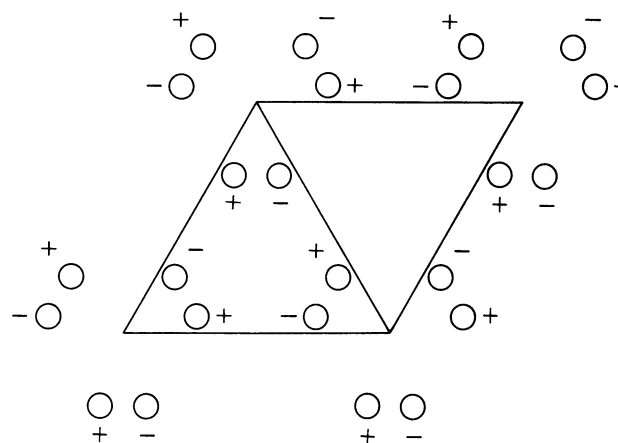
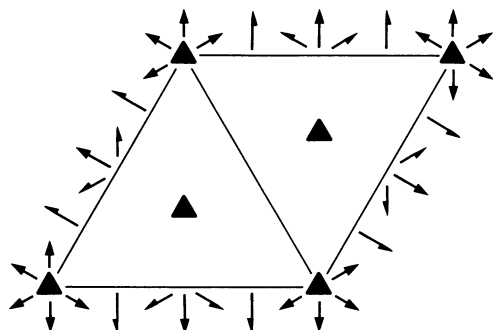
312

Trigonal

No. 149

P312

Patterson symmetry $P\bar{3}1m$



Origin at 312

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

Vertices $0,0,0 \quad \frac{1}{2},0,0 \quad \frac{2}{3},\frac{1}{3},0 \quad \frac{1}{3},\frac{2}{3},0 \quad 0,\frac{1}{2},0$
 $0,0,\frac{1}{2} \quad \frac{1}{2},0,\frac{1}{2} \quad \frac{2}{3},\frac{1}{3},\frac{1}{2} \quad \frac{1}{3},\frac{2}{3},\frac{1}{2} \quad 0,\frac{1}{2},\frac{1}{2}$

Symmetry operations

- (1) 1
- (2) $3^+ 0,0,z$
- (3) $3^- 0,0,z$
- (4) $2 \ x,\bar{x},0$
- (5) $2 \ x,2x,0$
- (6) $2 \ 2x,x,0$

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

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	Reflection conditions
6 <i>l</i> 1	(1) x,y,z (2) $\bar{y},x-y,z$ (3) $\bar{x}+y,\bar{x},z$ (4) \bar{y},\bar{x},\bar{z} (5) $\bar{x}+y,y,\bar{z}$ (6) $x,x-y,\bar{z}$	General: no conditions Special: no extra conditions
3 <i>k</i> ..2	$x,\bar{x},\frac{1}{2}$ $x,2x,\frac{1}{2}$ $2\bar{x},\bar{x},\frac{1}{2}$	
3 <i>j</i> ..2	$x,\bar{x},0$ $x,2x,0$ $2\bar{x},\bar{x},0$	
2 <i>i</i> 3..	$\frac{2}{3},\frac{1}{3},z$ $\frac{2}{3},\frac{1}{3},\bar{z}$	
2 <i>h</i> 3..	$\frac{1}{3},\frac{2}{3},z$ $\frac{1}{3},\frac{2}{3},\bar{z}$	
2 <i>g</i> 3..	$0,0,z$ $0,0,\bar{z}$	
1 <i>f</i> 3.2	$\frac{2}{3},\frac{1}{3},\frac{1}{2}$	
1 <i>e</i> 3.2	$\frac{2}{3},\frac{1}{3},0$	
1 <i>d</i> 3.2	$\frac{1}{3},\frac{2}{3},\frac{1}{2}$	
1 <i>c</i> 3.2	$\frac{1}{3},\frac{2}{3},0$	
1 <i>b</i> 3.2	$0,0,\frac{1}{2}$	
1 <i>a</i> 3.2	$0,0,0$	

Symmetry of special projections

Along [001] $p3m1$
 $\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$
 Origin at $0,0,z$

Along [100] $p11m$
 $\mathbf{a}' = \frac{1}{2}(\mathbf{a} + 2\mathbf{b})$ $\mathbf{b}' = \mathbf{c}$
 Origin at $x,0,0$

Along [210] $p2$
 $\mathbf{a}' = \frac{1}{2}\mathbf{b}$ $\mathbf{b}' = \mathbf{c}$
 Origin at $x,\frac{1}{2}x,0$