

Trigonal

$31m$

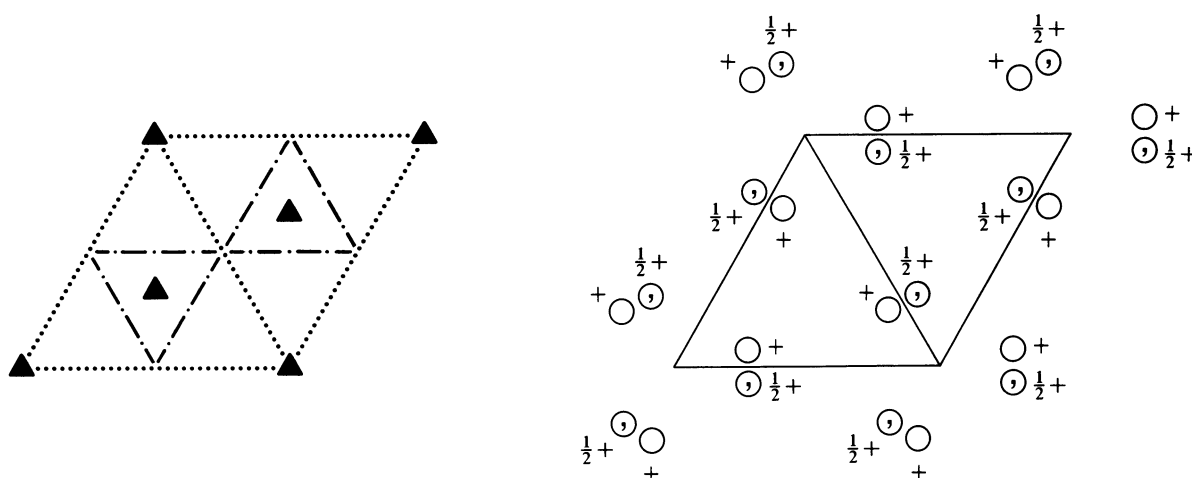
$C_{3v}^4$

$P31c$

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

$P31c$

No. 159



Origin on  $31c$

**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  $0,0,0$   $\frac{1}{2},0,0$   $\frac{2}{3},\frac{1}{3},0$   $\frac{1}{3},\frac{2}{3},0$   $0,\frac{1}{2},0$   
 $0,0,\frac{1}{2}$   $\frac{1}{2},0,\frac{1}{2}$   $\frac{2}{3},\frac{1}{3},\frac{1}{2}$   $\frac{1}{3},\frac{2}{3},\frac{1}{2}$   $0,\frac{1}{2},\frac{1}{2}$

**Symmetry operations**

- (1) 1 (2)  $3^+ 0,0,z$  (3)  $3^- 0,0,z$   
 (4)  $c x,x,z$  (5)  $c x,0,z$  (6)  $c 0,y,z$

**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 $c$ 1	(1) $x,y,z$ (2) $\bar{y},x-y,z$ (3) $\bar{x}+y,\bar{x},z$ (4) $y,x,z+\frac{1}{2}$ (5) $x-y,\bar{y},z+\frac{1}{2}$ (6) $\bar{x},\bar{x}+y,z+\frac{1}{2}$	General: $hh\bar{2}hl: l = 2n$ $000l: l = 2n$
2 $b$ 3..	$\frac{1}{3},\frac{2}{3},z$ $\frac{2}{3},\frac{1}{3},z+\frac{1}{2}$	Special: as above, plus $hkil: l = 2n$ or $h-k = 3n+1$ or $h-k = 3n+2$
2 $a$ 3..	$0,0,z$ $0,0,z+\frac{1}{2}$	$hkil: l = 2n$

**Symmetry of special projections**

Along  $[001]$   $p31m$   $\mathbf{a}' = \mathbf{a}$   $\mathbf{b}' = \mathbf{b}$   $\mathbf{c}' = \mathbf{c}$   
 Origin at  $0,0,z$   
 Along  $[100]$   $p1g1$   $\mathbf{a}' = \frac{1}{2}(\mathbf{a} + 2\mathbf{b})$   $\mathbf{b}' = \mathbf{c}$   
 Origin at  $x,0,0$   
 Along  $[210]$   $p1$   $\mathbf{a}' = \frac{1}{2}\mathbf{b}$   $\mathbf{b}' = \frac{1}{2}\mathbf{c}$   
 Origin at  $x,\frac{1}{2}x,0$