

$p\bar{3}1m$

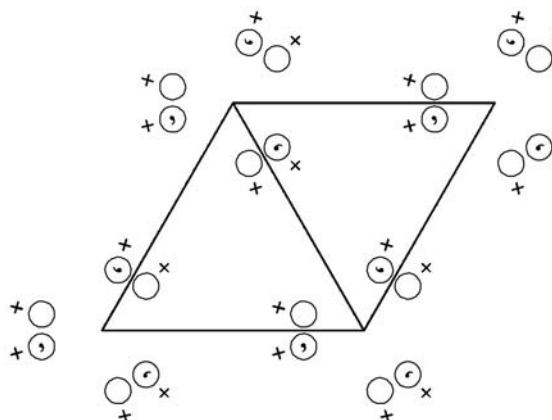
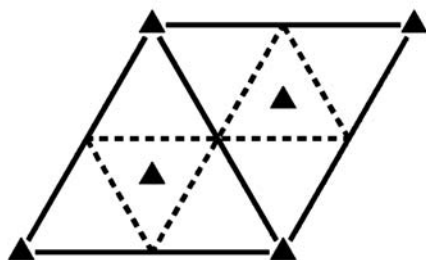
$31m$

Trigonal/Hexagonal

No. 70

$p\bar{3}1m$

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



Origin on $31m$

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

Symmetry operations

- | | | |
|----------------------------------|--------------------------------------|--------------------------------------|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z^+ 0,0,0) | (3) 3^- 0,0,z
(3_z^- 0,0,0) |
| (4) m x,x,z
(m_3 0,0,0) | (5) m x,0,z
(m_2 0,0,0) | (6) m 0,y,z
(m_1 0,0,0) |

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

Positions

		Coordinates			Reflection conditions
Multiplicity, Wyckoff letter, Site symmetry					General:
6	d 1	(1) x, y, z (4) y, x, z	(2) $\bar{y}, x - y, z$ (5) $x - y, \bar{y}, z$	(3) $\bar{x} + y, \bar{x}, z$ (6) $\bar{x}, \bar{x} + y, z$	no conditions
3	c $\dots m$	$x, 0, z$	$0, x, z$	\bar{x}, \bar{x}, z	Special: no extra conditions
2	b $3..$	$\frac{1}{3}, \frac{2}{3}, z$	$\frac{2}{3}, \frac{1}{3}, z$		
1	a $3.m$	$0, 0, z$			

Symmetry of special projections

Along [001] $p31m$

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

Origin at $0, 0, z$

Along [100] $\cancel{1}1m1$

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

Origin at $x, 0, 0$

Along [210] $\cancel{1}111$

$\mathbf{a}' = \frac{1}{2}\mathbf{b}$

Origin at $x, \frac{1}{2}x, 0$

Maximal non-isotypic subgroups

I	[2] $p311$ ($p3, 65$)	1; 2; 3
	[3] $p11m$ ($cm11, 13$)	1; 4
	[3] $p11m$ ($cm11, 13$)	1; 5
	[3] $p11m$ ($cm11, 13$)	1; 6

IIa none

IIb [3] $h31m$ ($\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$) ($p3m1, 69$)

Maximal isotypic subgroups of lowest index

IIc [4] $p31m$ ($\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$) (70)

Minimal non-isotypic supergroups

I [2] $p\bar{3}1m$ (71); [2] $p6mm$ (77); [2] $p\bar{6}2m$ (79)

II [2] $h31m$ ($p3m1, 69$)