

$p321$

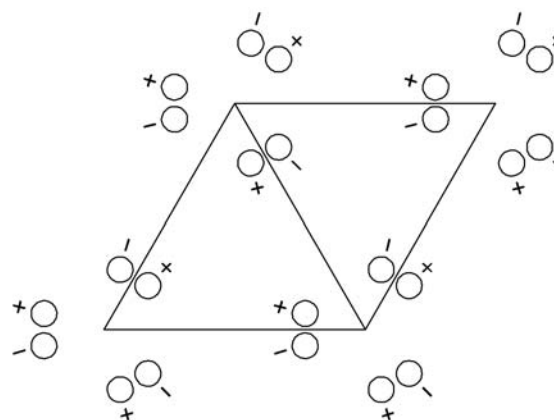
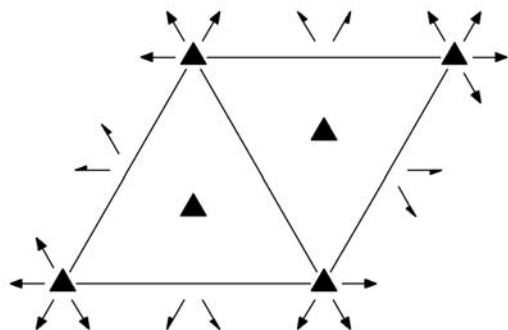
321

Trigonal/Hexagonal

No. 68

$p321$

Patterson symmetry $p\bar{3}m1$



Origin at 321

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

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^{-1} 0,0,0) |
| (4) 2 $x,x,0$
(2_{xy} 0,0,0) | (5) 2 $x,0,0$
(2_x 0,0,0) | (6) 2 $0,y,0$
(2_y 0,0,0) |

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

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			Reflection conditions
6 <i>e</i> 1	(1) x, y, z (4) y, x, \bar{z}	(2) $\bar{y}, x - y, z$ (5) $x - y, \bar{y}, \bar{z}$	(3) $\bar{x} + y, \bar{x}, z$ (6) $\bar{x}, \bar{x} + y, \bar{z}$	General: no conditions Special: no extra conditions
3 <i>d</i> .2.	$x, 0, 0$	$0, x, 0$	$\bar{x}, \bar{x}, 0$	
2 <i>c</i> 3..	$\frac{1}{3}, \frac{2}{3}, z$	$\frac{2}{3}, \frac{1}{3}, \bar{z}$		
2 <i>b</i> 3..	$0, 0, z$	$0, 0, \bar{z}$		
1 <i>a</i> 32.	$0, 0, 0$			

Symmetry of special projections

Along $[001]$ $p31m$
 $\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$
 Origin at $0, 0, z$

Along $[100]$ $\bar{2}11$
 $\mathbf{a}' = \frac{1}{2}(\mathbf{a} + 2\mathbf{b})$
 Origin at $x, 0, 0$

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

Maximal non-isotypic subgroups

I [2] $p311$ ($p3, 65$) 1; 2; 3
 [3] $p121$ ($c211, 10$) 1; 4
 [3] $p121$ ($c211, 10$) 1; 5
 [3] $p121$ ($c211, 10$) 1; 6

IIa none

IIb [3] $h321$ ($\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$) ($p312, 67$)

Maximal isotypic subgroups of lowest index

IIc [4] $p321$ ($\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$) (68)

Minimal non-isotypic supergroups

I [2] $p\bar{3}m1$ (72); [2] $p622$ (76); [2] $p\bar{6}2m$ (79)

II [2] $h321$ ($p312, 67$)