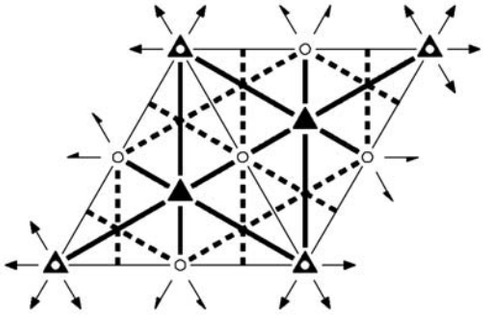
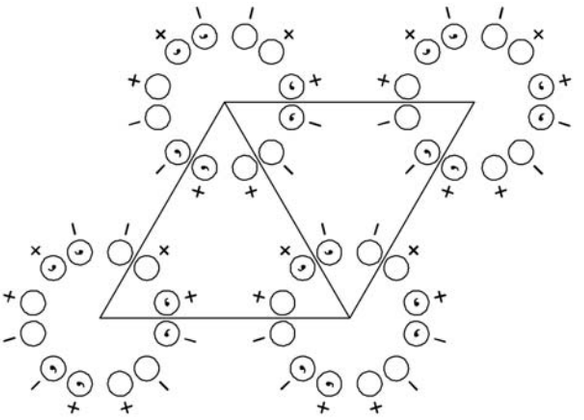
$p\bar{3}m1$ $\bar{3}m1$ Trigonal/Hexagonal

No. 72 $p\bar{3}2/m1$ Patterson symmetry $p\bar{3}m1$





Origin at centre $(\bar{3}m1)$

Asymmetric unit $0 \le x \le \frac{2}{3}$; $0 \le y \le \frac{1}{3}$; $x \le (1+y)/2$; $y \le x/2$

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

Symmetry operations

(1) 1	(2) 3^+ $0,0,z$	(3) 3^- $0,0,z$
(4) 2 $x,x,0$	(5) 2 $x,0,0$	(6) 2 $0,y,0$
(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) m $x,\bar{x},z$	(11) m $x,2x,z$	(12) m $2x,x,z$

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

Positions

Multiplicity, Wyckoff letter, Site symmetry			Coordinates			Reflection conditions
12	g	1	(1) x,y,z (4) $y,x,\bar{z}$ (7) $\bar{x},\bar{y},\bar{z}$ (10) $\bar{y},\bar{x},z$	(2) $\bar{y},x-y,z$ (5) $x-y,\bar{y},\bar{z}$ (8) $y,\bar{x}+y,\bar{z}$ (11) $\bar{x}+y,y,z$	(3) $\bar{x}+y,\bar{x},z$ (6) $\bar{x},\bar{x}+y,\bar{z}$ (9) $x-y,x,\bar{z}$ (12) $x,x-y,z$	General: no conditions
						Special: no extra conditions
6	f	. m .	$x,\bar{x},z$	$x,2x,z$	$2\bar{x},\bar{x},z$	$\bar{x},x,\bar{z}$	$2x,x,\bar{z}$	$\bar{x},2\bar{x},\bar{z}$
6	e	. 2 .	$x,0,0$	$0,x,0$	$\bar{x},\bar{x},0$	$\bar{x},0,0$	$0,\bar{x},0$	$x,x,0$
3	d	. $2/m$.	$\frac{1}{2},0,0$	$0,\frac{1}{2},0$	$\frac{1}{2},\frac{1}{2},0$			
2	c	3 m .	$\frac{1}{3},\frac{2}{3},z$	$\frac{2}{3},\frac{1}{3},\bar{z}$				
2	b	3 m .	$0,0,z$	$0,0,\bar{z}$				
1	a	$\bar{3}$ m .	$0,0,0$					

Symmetry of special projections

Along [001] $p6mm$
$\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$
Origin at $0,0,z$

Along [100] $\not p2\,1\,1$
$\mathbf{a}' = \frac{1}{2}(\mathbf{a}+2\mathbf{b})$
Origin at $x,0,0$

Along [210] $\not p2mm$
$\mathbf{a}' = \frac{1}{2}\mathbf{b}$
Origin at $x,\frac{1}{2}x,0$

Maximal non-isotypic subgroups

I [2] $p3m1$ (69) 1; 2; 3; 10; 11; 12
[2] $p312$ (68) 1; 2; 3; 4; 5; 6
[2] $p\bar{3}11$ ($p\bar{3}$, 66) 1; 2; 3; 7; 8; 9
[3] $p12/m1$ ($c2/m11$, 18) 1; 4; 7; 10
[3] $p12/m1$ ($c2/m11$, 18) 1; 5; 7; 11
[3] $p12/m1$ ($c2/m11$, 18) 1; 6; 7; 12

IIa none

IIb [3] $h\bar{3}m1$ ($\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$) ($p\bar{3}1m$, 71)

Maximal isotypic subgroups of lowest index

IIc [4] $p\bar{3}m1$ ($\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$) (72)

Minimal non-isotypic supergroups

I [2] $p6/mmm$ (80)

II [2] $h\bar{3}m1$ ($p\bar{3}1m$, 71)