

$p6mm$

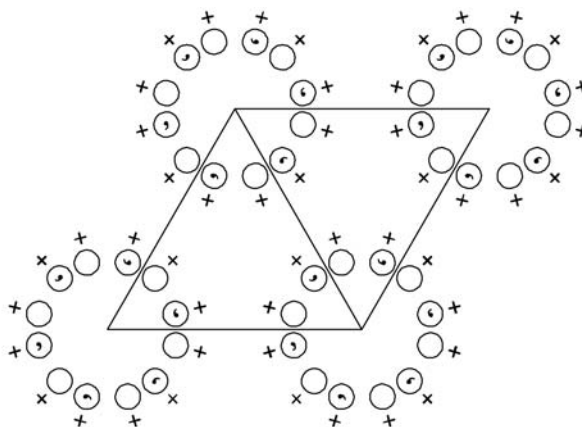
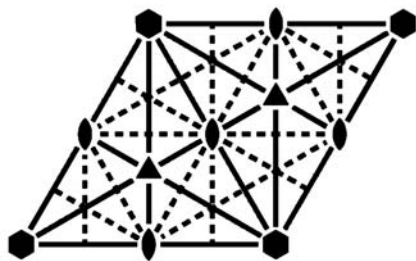
$6mm$

Hexagonal/Hexagonal

No. 77

$p6mm$

Patterson symmetry $p6/mmm$



Origin on $6mm$

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

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 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) m x, \bar{x}, z
(m_{xy} 0,0,0) | (8) m $x, 2x, z$
(m_x 0,0,0) | (9) m $2x, x, z$
(m_y 0,0,0) |
| (10) m x, x, z
(m_3 0,0,0) | (11) m $x, 0, z$
(m_2 0,0,0) | (12) m $0, y, z$
(m_1 0,0,0) |

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

Positions

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

Symmetry of special projections

Along [001] $p6mm$

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

Origin at $0, 0, z$

Along [100] $\neq 1m1$

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

Origin at $x, 0, 0$

Along [210] $\neq 1m1$

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

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

Maximal non-isotypic subgroups

I	[2] $p611$ ($p6, 73$)	1; 2; 3; 4; 5; 6
	[2] $p31m$ (70)	1; 2; 3; 10; 11; 12
	[2] $p3m1$ (69)	1; 2; 3; 7; 8; 9
	[3] $p2mm$ ($cm2, 26$)	1; 4; 7; 10
	[3] $p2mm$ ($cm2, 26$)	1; 4; 8; 11
	[3] $p2mm$ ($cm2, 26$)	1; 4; 9; 12

IIa none

IIb none

Maximal isotypic subgroups of lowest index

IIc [3] $h6mm$ ($\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$) ($p6mm, 77$)

Minimal non-isotypic supergroups

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

II none