

$P6mm$

C_{6v}^1

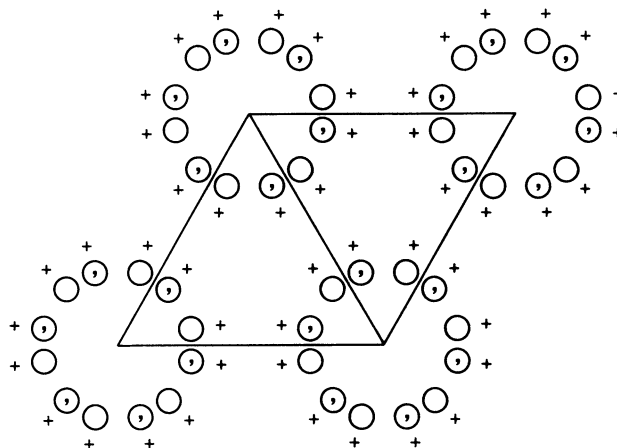
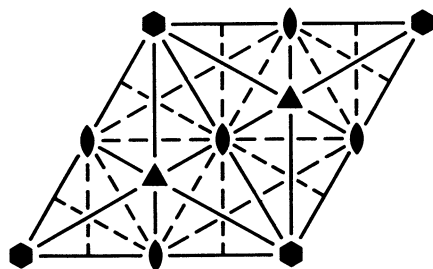
$6mm$

Hexagonal

No. 183

$P6mm$

Patterson symmetry $P6/mmm$



Origin on $6mm$

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

Symmetry operations

- | | | |
|-------------------------|---------------------|---------------------|
| (1) 1 | (2) 3^+ $0, 0, z$ | (3) 3^- $0, 0, z$ |
| (4) 2 $0, 0, z$ | (5) 6^- $0, 0, z$ | (6) 6^+ $0, 0, z$ |
| (7) m x, \bar{x}, z | (8) m $x, 2x, z$ | (9) m $2x, x, z$ |
| (10) m x, x, z | (11) m $x, 0, z$ | (12) m $0, y, z$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (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) $\bar{x} + y, \bar{x}, z$
			(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) $\bar{x}, \bar{x} + y, z$

General:

no conditions

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 projectionsAlong [001] $p6mm$ $\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$ Origin at $0, 0, z$ Along [100] $p1m1$ $\mathbf{a}' = \frac{1}{2}(\mathbf{a} + 2\mathbf{b})$ $\mathbf{b}' = \mathbf{c}$ Origin at $x, 0, 0$ Along [210] $p1m1$ $\mathbf{a}' = \frac{1}{2}\mathbf{b}$ $\mathbf{b}' = \mathbf{c}$ Origin at $x, \frac{1}{2}x, 0$ **Maximal non-isomorphic subgroups**

I	[2] $P611$ ($P6, 168$)	1; 2; 3; 4; 5; 6
	[2] $P31m$ (157)	1; 2; 3; 10; 11; 12
	[2] $P3m1$ (156)	1; 2; 3; 7; 8; 9
	{ [3] $P2mm$ ($Cmm2, 35$)	1; 4; 7; 10
	{ [3] $P2mm$ ($Cmm2, 35$)	1; 4; 8; 11
	{ [3] $P2mm$ ($Cmm2, 35$)	1; 4; 9; 12

IIa none**IIb** [2] $P6_3mc$ ($\mathbf{c}' = 2\mathbf{c}$) (186); [2] $P6_3cm$ ($\mathbf{c}' = 2\mathbf{c}$) (185); [2] $P6cc$ ($\mathbf{c}' = 2\mathbf{c}$) (184)**Maximal isomorphic subgroups of lowest index****IIc** [2] $P6mm$ ($\mathbf{c}' = 2\mathbf{c}$) (183); [3] $H6mm$ ($\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$) ($P6mm, 183$)**Minimal non-isomorphic supergroups****I** [2] $P6/mmm$ (191)**II** none