

$\mu 6/mmm$

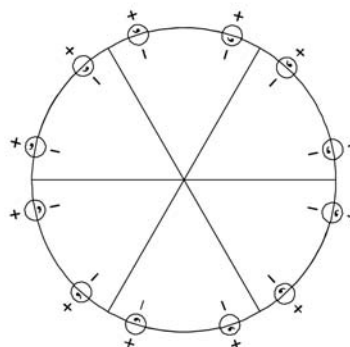
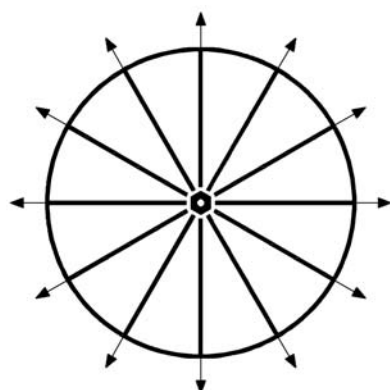
$6/mmm$

Hexagonal

No. 73

$\mu 6/m2/m2/m$

Patterson symmetry $\mu 6/mmm$



Origin at centre ($6/mmm$)

Asymmetric unit $0 \leq x; 0 \leq y; 0 \leq z \leq \frac{1}{2}; y \leq x/2$

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 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) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) |
| (9) 2 0,y,0
(2_y 0,0,0) | (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) | (16) m x,y,0
(m_z 0,0,0) |
| (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) | (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) |
| (21) m 2x,x,z
(m_y 0,0,0) | (22) m x,x,z
(m_3 0,0,0) | (23) m x,0,z
(m_2 0,0,0) | (24) m 0,y,z
(m_1 0,0,0) |

Generators selected (1); $t(0,0,1)$; (2); (4); (7); (13)

Positions

Multiplicity, Wyckoff letter, Site symmetry		Coordinates				Reflection conditions		
						General:		
						no conditions		
24	l 1	(1) x, y, z (5) $y, \bar{x} + y, z$ (9) $\bar{x}, \bar{x} + y, \bar{z}$ (13) $\bar{x}, \bar{y}, \bar{z}$ (17) $\bar{y}, x - y, \bar{z}$ (21) $x, x - y, z$	(2) $\bar{y}, x - y, z$ (6) $x - y, x, z$ (10) $\bar{y}, \bar{x}, \bar{z}$ (14) $y, \bar{x} + y, \bar{z}$ (18) $\bar{x} + y, \bar{x}, \bar{z}$ (22) y, x, z	(3) $\bar{x} + y, \bar{x}, z$ (7) y, x, \bar{z} (11) $\bar{x} + y, y, \bar{z}$ (15) $x - y, x, \bar{z}$ (19) \bar{y}, \bar{x}, z (23) $x - y, \bar{y}, z$	(4) \bar{x}, \bar{y}, z (8) $x - y, \bar{y}, \bar{z}$ (12) $x, x - y, \bar{z}$ (16) x, y, \bar{z} (20) $\bar{x} + y, y, z$ (24) $\bar{x}, \bar{x} + y, z$	Special: no extra conditions		
12	k $m..$	$x, y, \frac{1}{2}$ $y, x, \frac{1}{2}$	$\bar{y}, x - y, \frac{1}{2}$ $x - y, \bar{y}, \frac{1}{2}$	$\bar{x} + y, \bar{x}, \frac{1}{2}$ $\bar{x}, \bar{x} + y, \frac{1}{2}$	$\bar{x}, \bar{y}, \frac{1}{2}$ $\bar{y}, \bar{x}, \frac{1}{2}$	$y, \bar{x} + y, \frac{1}{2}$ $\bar{x} + y, y, \frac{1}{2}$	$x - y, x, \frac{1}{2}$ $x, x - y, \frac{1}{2}$	
12	j $m..$	$x, y, 0$ $y, x, 0$	$\bar{y}, x - y, 0$ $x - y, \bar{y}, 0$	$\bar{x} + y, \bar{x}, 0$ $\bar{x}, \bar{x} + y, 0$	$\bar{x}, \bar{y}, 0$ $\bar{y}, \bar{x}, 0$	$y, \bar{x} + y, 0$ $\bar{x} + y, y, 0$	$x - y, x, 0$ $x, x - y, 0$	
12	i $.m.$	$x, 2x, z$ $2x, x, \bar{z}$	$2\bar{x}, \bar{x}, z$ $\bar{x}, 2\bar{x}, \bar{z}$	x, \bar{x}, z \bar{x}, x, \bar{z}	$\bar{x}, 2\bar{x}, z$ $2\bar{x}, \bar{x}, \bar{z}$	$2x, x, z$ $x, 2x, \bar{z}$	\bar{x}, x, z x, \bar{x}, \bar{z}	
12	h $..m$	$x, 0, z$ $0, x, \bar{z}$	$0, x, z$ $x, 0, \bar{z}$	\bar{x}, \bar{x}, z $\bar{x}, \bar{x}, \bar{z}$	$\bar{x}, 0, z$ $0, \bar{x}, \bar{z}$	$0, \bar{x}, z$ $\bar{x}, 0, \bar{z}$	x, x, z x, x, \bar{z}	
6	g $mm2$	$x, 2x, \frac{1}{2}$	$2\bar{x}, \bar{x}, \frac{1}{2}$	$x, \bar{x}, \frac{1}{2}$	$\bar{x}, 2\bar{x}, \frac{1}{2}$	$2x, x, \frac{1}{2}$	$\bar{x}, x, \frac{1}{2}$	
6	f $mm2$	$x, 2x, 0$	$2\bar{x}, \bar{x}, 0$	$x, \bar{x}, 0$	$\bar{x}, 2\bar{x}, 0$	$2x, x, 0$	$\bar{x}, x, 0$	
6	e $m2m$	$x, 0, \frac{1}{2}$	$0, x, \frac{1}{2}$	$\bar{x}, \bar{x}, \frac{1}{2}$	$\bar{x}, 0, \frac{1}{2}$	$0, \bar{x}, \frac{1}{2}$	$x, x, \frac{1}{2}$	
6	d $m2m$	$x, 0, 0$	$0, x, 0$	$\bar{x}, \bar{x}, 0$	$\bar{x}, 0, 0$	$0, \bar{x}, 0$	$x, x, 0$	
2	c $6mm$	$0, 0, z$	$0, 0, \bar{z}$					
1	b $6/mmm$	$0, 0, \frac{1}{2}$						
1	a $6/mmm$	$0, 0, 0$						

Symmetry of special projections

Along [001] $6mm$

Along [100] $\bar{6}2mm$

Along [210] $\bar{6}2mm$

Origin at $0, 0, z$

$\mathbf{a}' = \mathbf{c}$
Origin at $x, 0, 0$

$\mathbf{a}' = \mathbf{c}$
Origin at $x, \frac{1}{2}x, 0$

Maximal non-isotypic non-enantiomorphic subgroups

I	$[2]\bar{6}2m (\bar{6}m2, 71)$	1; 2; 3; 7; 8; 9; 16; 17; 18; 22; 23; 24
	$[2]\bar{6}m2 (71)$	1; 2; 3; 10; 11; 12; 16; 17; 18; 19; 20; 21
	$[2]\bar{6}mm (68)$	1; 2; 3; 4; 5; 6; 19; 20; 21; 22; 23; 24
	$[2]\bar{6}22 (62)$	1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 11; 12
	$[2]\bar{6}/m11 (\bar{6}/m, 60)$	1; 2; 3; 4; 5; 6; 13; 14; 15; 16; 17; 18
	$[2]\bar{6}3m1 (\bar{6}31m, 51)$	1; 2; 3; 7; 8; 9; 13; 14; 15; 19; 20; 21
	$[2]\bar{6}31m (51)$	1; 2; 3; 10; 11; 12; 13; 14; 15; 22; 23; 24
	$[3]\bar{6}mmm (\bar{6}mmm, 20)$	1; 4; 7; 10; 13; 16; 19; 22
	$[3]\bar{6}mmm (\bar{6}mmm, 20)$	1; 4; 8; 11; 13; 16; 20; 23
	$[3]\bar{6}mmm (\bar{6}mmm, 20)$	1; 4; 9; 12; 13; 16; 21; 24

IIa none

IIb $[2]\bar{6}_3/mmc (\mathbf{c}' = 2\mathbf{c}) (75)$; $[2]\bar{6}_3/mcm (\mathbf{c}' = 2\mathbf{c}) (\bar{6}_3/mmc, 75)$; $[2]\bar{6}_3/mcc (\mathbf{c}' = 2\mathbf{c}) (74)$

Maximal isotypic subgroups and enantiomorphic subgroups of lowest index

IIc $[2]\bar{6}/mmm (\mathbf{c}' = 2\mathbf{c}) (73)$

Minimal non-isotypic non-enantiomorphic supergroups

I none

II none