

$\mu 6_3 m c$

$6 m m$

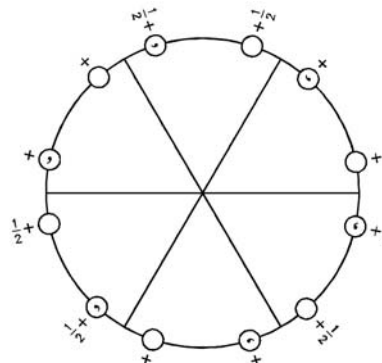
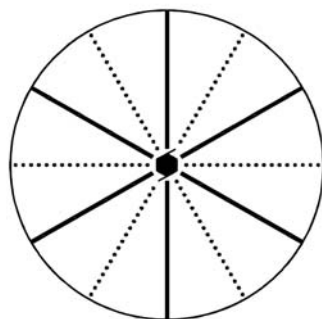
Hexagonal

No. 70

$\mu 6_3 m c$

Patterson symmetry $\mu 6/m m m$

FIRST SETTING



Origin on $3m1$ on $6_3 m c$

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

Symmetry operations

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

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

Positions

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

Symmetry of special projections

Along [001] $6mm$	Along [100] $\mu 11g$	Along [210] $\mu 11m$
Origin at $0, 0, z$	$\mathbf{a}' = \mathbf{c}$ Origin at $x, 0, 0$	$\mathbf{a}' = \frac{1}{2}\mathbf{c}$ Origin at $x, \frac{1}{2}x, 0$

Maximal non-isotypic non-enantiomorphic subgroups

I	$[2]\mu 6_3 11 (\mu 6_3, 56)$	1; 2; 3; 4; 5; 6
	$[2]\mu 31c (\mu 3c1, 50)$	1; 2; 3; 10; 11; 12
	$[2]\mu 3m1 (49)$	1; 2; 3; 7; 8; 9
	$[3]\mu 2, mc (\mu mc2, 17)$	1; 4; 7; 10
	$[3]\mu 2, mc (\mu mc2, 17)$	1; 4; 8; 11
	$[3]\mu 2, mc (\mu mc2, 17)$	1; 4; 9; 12

IIa none

IIb none

Maximal isotypic subgroups and enantiomorphic subgroups of lowest index

IIc $[3]\mu 6_3 mc (\mathbf{c}' = 3\mathbf{c}) (70)$

Minimal non-isotypic non-enantiomorphic supergroups

I $[2]\mu 6_3 / m mc (75)$

II $[2]\mu 6 mm (\mathbf{c}' = \frac{1}{2}\mathbf{c}) (68)$

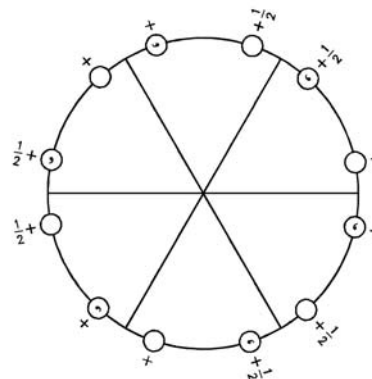
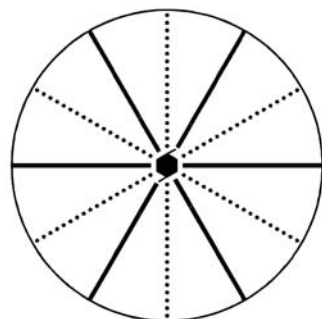
$\mu 6_3 cm$ $6mm$

Hexagonal

No. 70

 $\mu 6_3 cm$ Patterson symmetry $\mu 6/mmm$

SECOND SETTING

**Origin** on $31m$ on 6_3cm **Asymmetric unit** $0 \leq x; 0 \leq y; 0 \leq z \leq 1; y \leq x/2$ **Symmetry operations**

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

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

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates						Reflection conditions
							General:
12 <i>c</i> 1	(1) x, y, z	(2) $\bar{y}, x - y, z$	(3) $\bar{x} + y, \bar{x}, z$				$l : l = 2n$
	(4) $\bar{x}, \bar{y}, z + \frac{1}{2}$	(5) $y, \bar{x} + y, z + \frac{1}{2}$	(6) $x - y, x, z + \frac{1}{2}$				
	(7) $\bar{y}, \bar{x}, z + \frac{1}{2}$	(8) $\bar{x} + y, y, z + \frac{1}{2}$	(9) $x, x - y, z + \frac{1}{2}$				
	(10) y, x, z	(11) $x - y, \bar{y}, z$	(12) $\bar{x}, \bar{x} + y, z$				
							Special: no extra conditions
6 <i>b</i> $\dots m$	$x, 0, z$	$0, x, z$	\bar{x}, \bar{x}, z	$\bar{x}, 0, z + \frac{1}{2}$	$0, \bar{x}, z + \frac{1}{2}$	$x, x, z + \frac{1}{2}$	
2 <i>a</i> $3 \dots m$	$0, 0, z$	$0, 0, z + \frac{1}{2}$					

Symmetry of special projections

Along [001] $6mm$	Along [100] $\mu 11m$	Along [210] $\mu 11g$
Origin at $0, 0, z$	$\mathbf{a}' = \frac{1}{2}\mathbf{c}$ Origin at $x, 0, 0$	$\mathbf{a}' = \mathbf{c}$ Origin at $x, \frac{1}{2}x, 0$

Maximal non-isotypic non-enantiomorphic subgroups

I	$[2] \mu 6_3 11 (\mu 6_3, 56)$	1; 2; 3; 4; 5; 6
	$[2] \mu 3c1 (50)$	1; 2; 3; 7; 8; 9
	$[2] \mu 31m (\mu 3m1, 49)$	1; 2; 3; 10; 11; 12
	$[3] \mu 2_1 cm (\mu mc2_1, 17)$	1; 4; 7; 10
	$[3] \mu 2_1 cm (\mu mc2_1, 17)$	1; 4; 8; 11
	$[3] \mu 2_1 cm (\mu mc2_1, 17)$	1; 4; 9; 12

IIa none

IIb none

Maximal isotypic subgroups and enantiomorphic subgroups of lowest index

IIc $[3] \mu 6_3 cm (\mathbf{c}' = 3\mathbf{c}) (\mu 6_3 mc, 70)$

Minimal non-isotypic non-enantiomorphic supergroups

I $[2] \mu 6_3 / m m c (75)$

II $[2] \mu 6 m m (\mathbf{c}' = \frac{1}{2}\mathbf{c}) (68)$