

$\mu 6_1 22$

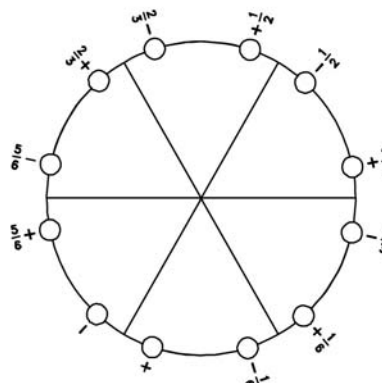
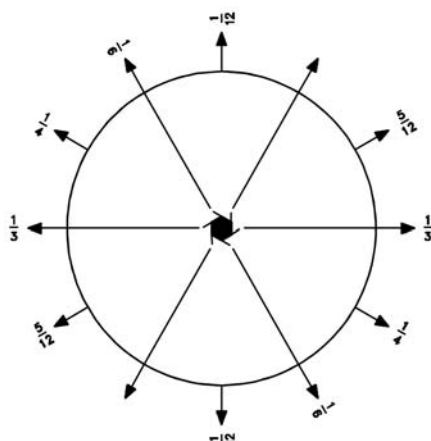
622

Hexagonal

No. 63

$\mu 6_1 22$

Patterson symmetry  $\mu 6/mmm$



Origin on  $2[100]$  at  $6_1(2, 1, 1)1$

Asymmetric unit  $0 \leq z \leq \frac{1}{12}$

Symmetry operations

- |  |   |   |
|--|---|---|
| (1) 1<br>(1 0, 0, 0)   | (2) $3^+(\frac{1}{3})$ 0, 0, z<br>( $3_2$  0, 0, $\frac{1}{3}$ )      | (3) $3^-(\frac{2}{3})$ 0, 0, z<br>( $3_2^{-1}$  0, 0, $\frac{2}{3}$ ) |
| (4) $2(\frac{1}{2})$ 0, 0, z<br>( $2_z$  0, 0, $\frac{1}{2}$ )         | (5) $6^-(\frac{5}{6})$ 0, 0, z<br>( $6_2^{-1}$  0, 0, $\frac{5}{6}$ ) | (6) $6^+(\frac{1}{6})$ 0, 0, z<br>( $6_2$  0, 0, $\frac{1}{6}$ )      |
| (7) 2 x, x, $\frac{1}{6}$<br>( $2_{xy}$  0, 0, $\frac{1}{3}$ )         | (8) 2 x, 0, 0<br>( $2_x$  0, 0, 0)                                    | (9) 2 0, y, $\frac{1}{3}$<br>( $2_y$  0, 0, $\frac{2}{3}$ )           |
| (10) 2 x, $\bar{x}$ , $\frac{5}{12}$<br>( $2_3$  0, 0, $\frac{5}{6}$ ) | (11) 2 x, 2x, $\frac{1}{4}$<br>( $2_2$  0, 0, $\frac{1}{2}$ )         | (12) 2 2x, x, $\frac{1}{12}$<br>( $2_1$  0, 0, $\frac{1}{6}$ )        |

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

**Positions**

Multiplicity, Wyckoff letter, Site symmetry	Coordinates						Reflection conditions
12 <i>c</i> 1	(1) $x, y, z$ (4) $\bar{x}, \bar{y}, z + \frac{1}{2}$ (7) $y, x, \bar{z} + \frac{1}{3}$ (10) $\bar{y}, \bar{x}, \bar{z} + \frac{2}{6}$	(2) $\bar{y}, x - y, z + \frac{1}{3}$ (5) $y, \bar{x} + y, z + \frac{5}{6}$ (8) $x - y, \bar{y}, \bar{z}$ (11) $\bar{x} + y, y, \bar{z} + \frac{1}{2}$	(3) $\bar{x} + y, \bar{x}, z + \frac{2}{3}$ (6) $x - y, x, z + \frac{1}{6}$ (9) $\bar{x}, \bar{x} + y, \bar{z} + \frac{2}{3}$ (12) $x, x - y, \bar{z} + \frac{1}{6}$				General: $l : l = 6n$
6 <i>b</i> . . 2	$x, 2x, \frac{1}{4}$	$2\bar{x}, \bar{x}, \frac{7}{12}$	$x, \bar{x}, \frac{11}{12}$	$\bar{x}, 2\bar{x}, \frac{3}{4}$	$2x, x, \frac{1}{12}$	$\bar{x}, x, \frac{5}{12}$	Special: as above, plus $l : l = 2n$ or $l = 3n + 1$ or $l = 3n + 2$
6 <i>a</i> . 2 .	$x, 0, 0$	$0, x, \frac{1}{3}$	$\bar{x}, \bar{x}, \frac{2}{3}$	$\bar{x}, 0, \frac{1}{2}$	$0, \bar{x}, \frac{5}{6}$	$x, x, \frac{1}{6}$	$l : l = 2n$ or $l = 3n + 1$ or $l = 3n + 2$

**Symmetry of special projections**

Along [001]  $6mm$

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

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

Origin at  $0, 0, z$

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

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

Origin at  $x, 0, 0$

Origin at  $x, \frac{1}{2}x, \frac{1}{12}$

**Maximal non-isotypic non-enantiomorphic subgroups**

<b>I</b>	[2] $\bar{6}_1 11$ ( $\bar{6}_1, 54$ )	1; 2; 3; 4; 5; 6
	[2] $\bar{3}_1 21$ ( $\bar{3}_1 12, 47$ )	1; 2; 3; 7; 8; 9
	[2] $\bar{3}_1 12$ (47)	1; 2; 3; 10; 11; 12
	[3] $\bar{2}_1 22$ ( $\bar{2} 222_1, 14$ )	1; 4; 7; 10
	[3] $\bar{2}_1 22$ ( $\bar{2} 222_1, 14$ )	1; 4; 8; 11
	[3] $\bar{2}_1 22$ ( $\bar{2} 222_1, 14$ )	1; 4; 9; 12

**IIa** none

**IIb** none

**Maximal isotypic subgroups and enantiomorphic subgroups of lowest index**

**IIc** [5]  $\bar{6}_3 22$  ( $\mathbf{c}' = 5\mathbf{c}$ ) (67); [7]  $\bar{6}_1 22$  ( $\mathbf{c}' = 7\mathbf{c}$ ) (63)

**Minimal non-isotypic non-enantiomorphic supergroups**

**I** none

**II** [2]  $\bar{6}_2 22$  ( $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ ) (64); [3]  $\bar{6}_3 22$  ( $\mathbf{c}' = \frac{1}{3}\mathbf{c}$ ) (65)