

$p6mm$

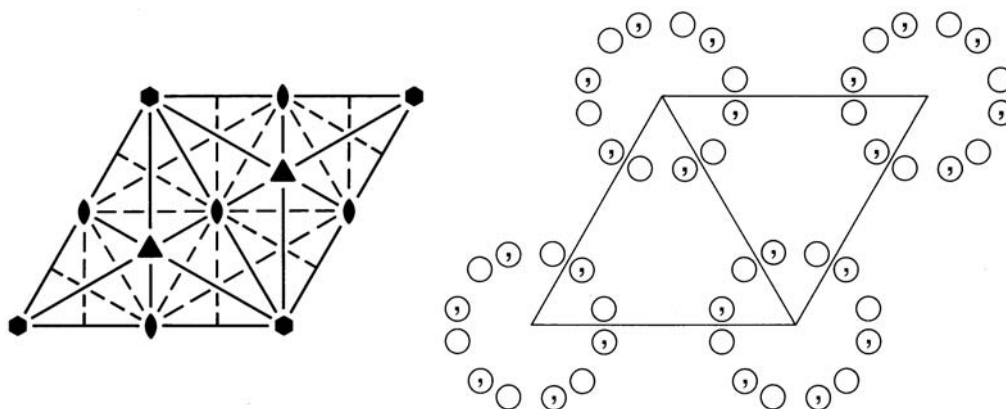
$6mm$

Hexagonal

No. 17

$p6mm$

Patterson symmetry  $p6mm$



Origin at  $6mm$

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

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

**Positions**

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

**Maximal non-isomorphic subgroups**

|          |                            |                     |
|----------|----------------------------|---------------------|
| <b>I</b> | [2] $p611$ ( $p6, 16$ )    | 1; 2; 3; 4; 5; 6    |
|          | [2] $p31m$ (15)            | 1; 2; 3; 10; 11; 12 |
|          | [2] $p3m1$ (14)            | 1; 2; 3; 7; 8; 9    |
|          | { [3] $p2mm$ ( $c2mm, 9$ ) | 1; 4; 7; 10         |
|          | { [3] $p2mm$ ( $c2mm, 9$ ) | 1; 4; 8; 11         |
|          | { [3] $p2mm$ ( $c2mm, 9$ ) | 1; 4; 9; 12         |

**IIa** none

**IIb** none

**Maximal isomorphic subgroups of lowest index**

**IIc** [3]  $h6mm$  ( $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$ ) ( $p6mm, 17$ )

**Minimal non-isomorphic supergroups**

**I** none

**II** none