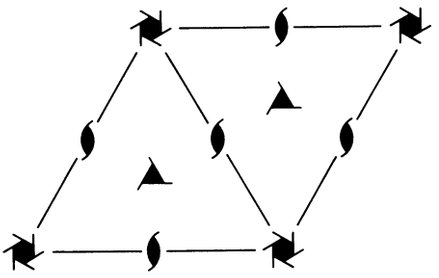
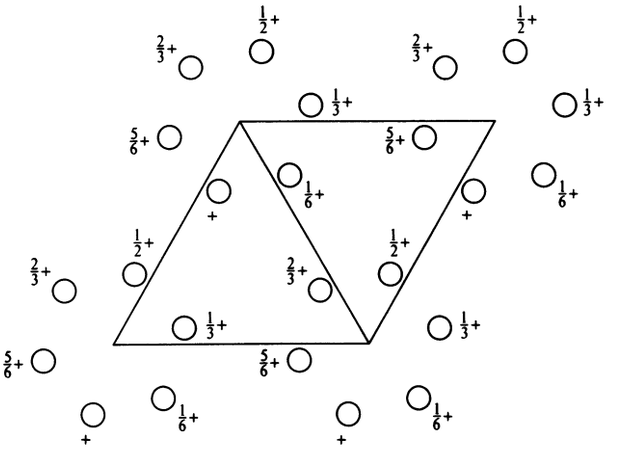
$P6_1$ C_6^2 6 Hexagonal

No. 169 $P6_1$ Patterson symmetry $P6/m$





Origin on 6_1

Asymmetric unit $0 \le x \le 1;\quad 0 \le y \le 1;\quad 0 \le z \le \frac{1}{6}$

Vertices $0,0,0\quad 1,0,0\quad 1,1,0\quad 0,1,0$
$0,0,\frac{1}{6}\quad 1,0,\frac{1}{6}\quad 1,1,\frac{1}{6}\quad 0,1,\frac{1}{6}$

Symmetry operations

(1) 1 (2) $3^+(0,0,\frac{1}{3})$ $0,0,z$ (3) $3^-(0,0,\frac{2}{3})$ $0,0,z$
(4) $2(0,0,\frac{1}{2})$ $0,0,z$ (5) $6^-(0,0,\frac{5}{6})$ $0,0,z$ (6) $6^+(0,0,\frac{1}{6})$ $0,0,z$

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

Positions

Multiplicity, Wyckoff letter, Site symmetry		Coordinates			Reflection conditions
					General:
6 a 1	(1) x,y,z	(2) $\bar{y},x-y,z+\frac{1}{3}$	(3) $\bar{x}+y,\bar{x},z+\frac{2}{3}$		$000l$: $l=6n$
	(4) $\bar{x},\bar{y},z+\frac{1}{2}$	(5) $y,\bar{x}+y,z+\frac{5}{6}$	(6) $x-y,x,z+\frac{1}{6}$		

Symmetry of special projections

Along [001] $p6$
$\mathbf{a}'=\mathbf{a}$ $\mathbf{b}'=\mathbf{b}$
Origin at $0,0,z$

Along [100] $p1g1$
$\mathbf{a}'=\frac{1}{2}(\mathbf{a}+2\mathbf{b})$ $\mathbf{b}'=\mathbf{c}$
Origin at $x,0,0$

Along [210] $p1g1$
$\mathbf{a}'=\frac{1}{2}\mathbf{b}$ $\mathbf{b}'=\mathbf{c}$
Origin at $x,\frac{1}{2}x,0$

Maximal non-isomorphic subgroups

I [2] $P3_1$ (144) 1; 2; 3
[3] $P2_1$ (4) 1; 4

IIa none

IIb none

Maximal isomorphic subgroups of lowest index

IIc [3] $H6_1$ ($\mathbf{a}'=3\mathbf{a},\mathbf{b}'=3\mathbf{b}$) ($P6_1$, 169); [5] $P6_5$ ($\mathbf{c}'=5\mathbf{c}$) (170); [7] $P6_1$ ($\mathbf{c}'=7\mathbf{c}$) (169)

Minimal non-isomorphic supergroups

I [2] $P6_122$ (178)

II [2] $P6_2$ ($\mathbf{c}'=\frac{1}{2}\mathbf{c}$) (171); [3] $P6_3$ ($\mathbf{c}'=\frac{1}{3}\mathbf{c}$) (173)