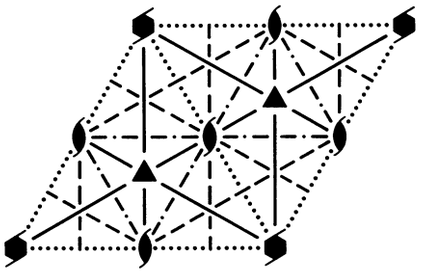
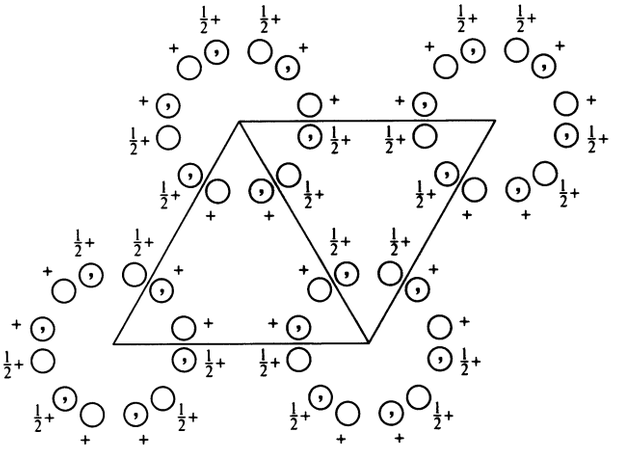
Hexagonal $6mm$ C_{6v}^4 $P6_3mc$

Patterson symmetry $P6/mmm$ $P6_3mc$ No. 186





Origin on $3m1$ on 6_3mc

Asymmetric unit $0 \le x \le \frac{2}{3}$; $0 \le y \le \frac{1}{3}$; $0 \le z \le 1$; $x \le (1+y)/2$; $y \le x/2$

Vertices $0,0,0$ $\frac{1}{2},0,0$ $\frac{2}{3},\frac{1}{3},0$
$0,0,1$ $\frac{1}{2},0,1$ $\frac{2}{3},\frac{1}{3},1$

Symmetry operations

(1) 1	(2) 3^+ $0,0,z$	(3) 3^- $0,0,z$
(4) $2(0,0,\frac{1}{2})$ $0,0,z$	(5) $6^-(0,0,\frac{1}{2})$ $0,0,z$	(6) $6^+(0,0,\frac{1}{2})$ $0,0,z$
(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); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates						Reflection conditions
							General:
12 d 1	(1) x,y,z	(2) $\bar{y},x-y,z$	(3) $\bar{x}+y,\bar{x},z$				$hh\overline{2h}l$: $l=2n$
	(4) $\bar{x},\bar{y},z+\frac{1}{2}$	(5) $y,\bar{x}+y,z+\frac{1}{2}$	(6) $x-y,x,z+\frac{1}{2}$				$000l$: $l=2n$
	(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: as above, plus
6 c . m .	$x,\bar{x},z$	$x,2x,z$	$2\bar{x},\bar{x},z$	$\bar{x},x,z+\frac{1}{2}$	$\bar{x},2\bar{x},z+\frac{1}{2}$	$2x,x,z+\frac{1}{2}$	no extra conditions
2 b $3m$.	$\frac{1}{3},\frac{2}{3},z$	$\frac{2}{3},\frac{1}{3},z+\frac{1}{2}$					$hkil$: $l=2n$ or $h-k=3n+1$ or $h-k=3n+2$
2 a $3m$.	$0,0,z$	$0,0,z+\frac{1}{2}$					$hkil$: $l=2n$

Symmetry of special projections

Along [001] $p6mm$
$\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$
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] $p1m1$
$\mathbf{a}' = \frac{1}{2}\mathbf{b}$ $\mathbf{b}' = \frac{1}{2}\mathbf{c}$
Origin at $x,\frac{1}{2}x,0$