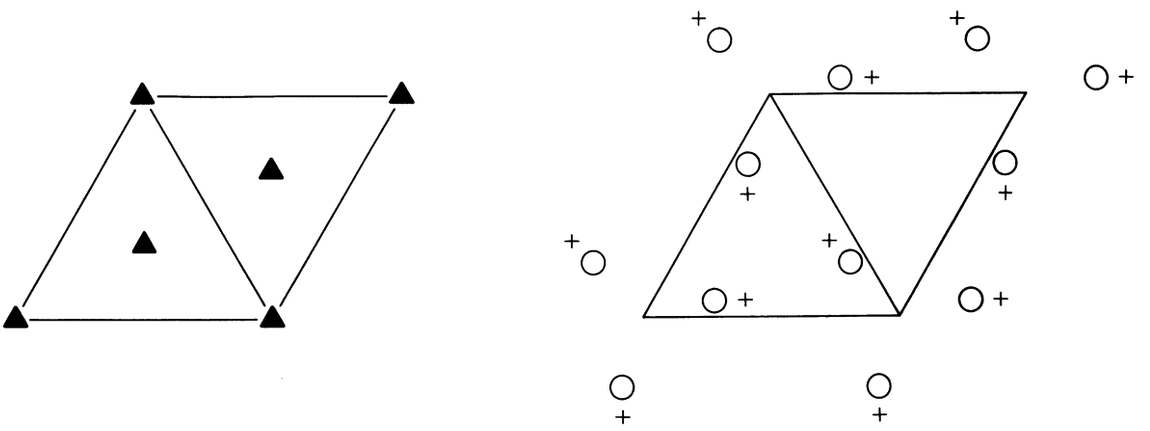
$P3$ C_3^1 3 Trigonal

No. 143 $P3$ Patterson symmetry $P\bar{3}$



Origin on 3

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

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

Symmetry operations

(1) 1 (2) 3^+ $0,0,z$ (3) 3^- $0,0,z$

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

Positions

Multiplicity, Wyckoff letter, Site symmetry			Coordinates			Reflection conditions
						General:
3	d	1	(1) x,y,z	(2) $\bar{y},x-y,z$	(3) $\bar{x}+y,\bar{x},z$	no conditions
						Special: no extra conditions
1	c	3 . .	$\frac{2}{3},\frac{1}{3},z$			
1	b	3 . .	$\frac{1}{3},\frac{2}{3},z$			
1	a	3 . .	$0,0,z$			

Symmetry of special projections

Along [001] $p3$
$\mathbf{a}'=\mathbf{a}$ $\mathbf{b}'=\mathbf{b}$
Origin at $0,0,z$

Along [100] $p1$
$\mathbf{a}'=\frac{1}{2}(\mathbf{a}+2\mathbf{b})$ $\mathbf{b}'=\mathbf{c}$
Origin at $x,0,0$

Along [210] $p1$
$\mathbf{a}'=\frac{1}{2}\mathbf{b}$ $\mathbf{b}'=\mathbf{c}$
Origin at $x,\frac{1}{2}x,0$

Maximal non-isomorphic subgroups

I [3] $P1$ (1) 1

IIa none

IIb [3] $P3_2$ ($\mathbf{c}'=3\mathbf{c}$) (145); [3] $P3_1$ ($\mathbf{c}'=3\mathbf{c}$) (144); [3] $R3$ ($\mathbf{a}'=\mathbf{a}-\mathbf{b},\mathbf{b}'=\mathbf{a}+2\mathbf{b},\mathbf{c}'=3\mathbf{c}$) (146); [3] $R3$ ($\mathbf{a}'=2\mathbf{a}+\mathbf{b},\mathbf{b}'=-\mathbf{a}+\mathbf{b},\mathbf{c}'=3\mathbf{c}$) (146)

Maximal isomorphic subgroups of lowest index

IIc [2] $P3$ ($\mathbf{c}'=2\mathbf{c}$) (143); [3] $H3$ ($\mathbf{a}'=3\mathbf{a},\mathbf{b}'=3\mathbf{b}$) ($P3$, 143)

Minimal non-isomorphic supergroups

I [2] $P\bar{3}$ (147); [2] $P312$ (149); [2] $P321$ (150); [2] $P3m1$ (156); [2] $P31m$ (157); [2] $P3c1$ (158); [2] $P31c$ (159); [2] $P6$ (168); [2] $P6_3$ (173); [2] $P\bar{6}$ (174)

II [3] $R3$ (obverse) (146); [3] $R3$ (reverse) (146)