

$P3$

C_3^1

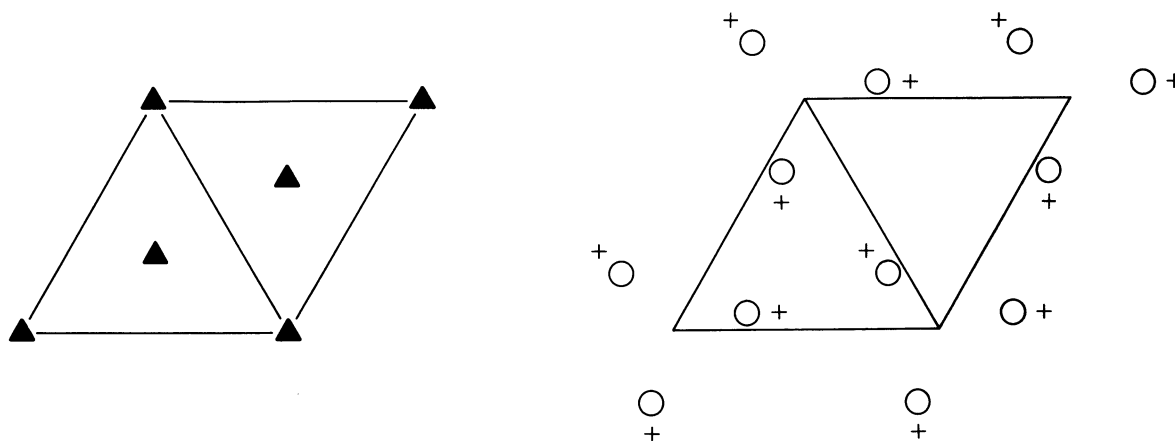
3

Trigonal

No. 143

$P3$

Patterson symmetry $P\bar{3}$



Origin on 3

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

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
3 <i>d</i> 1	(1) x, y, z (2) $\bar{y}, x - y, z$ (3) $\bar{x} + y, \bar{x}, z$	General: no conditions Special: no extra conditions
1 <i>c</i> 3..	$\frac{2}{3}, \frac{1}{3}, z$	
1 <i>b</i> 3..	$\frac{1}{3}, \frac{2}{3}, z$	
1 <i>a</i> 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 $x, \frac{1}{2}x, 0$
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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)