

$P4$

C_4^1

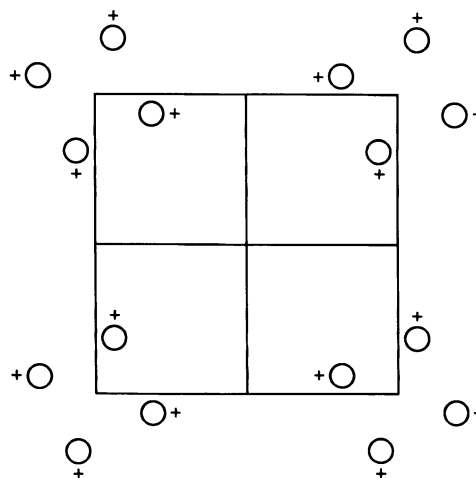
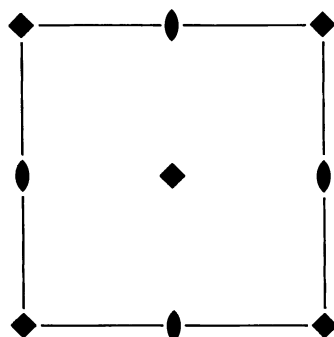
4

Tetragonal

No. 75

$P4$

Patterson symmetry $P4/m$



Origin on 4

Asymmetric unit $0 \leq x \leq \frac{1}{2}; 0 \leq y \leq \frac{1}{2}; 0 \leq z \leq 1$

Symmetry operations

(1) 1 (2) 2 0,0,z (3) 4⁺ 0,0,z (4) 4⁻ 0,0,z

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	Reflection conditions
4 <i>d</i> 1	(1) x,y,z (2) \bar{x},\bar{y},z (3) \bar{y},x,z (4) y,\bar{x},z	General: no conditions
2 <i>c</i> 2..	$0, \frac{1}{2}, z$ $\frac{1}{2}, 0, z$	Special: $hkl : h + k = 2n$
1 <i>b</i> 4..	$\frac{1}{2}, \frac{1}{2}, z$	no extra conditions
1 <i>a</i> 4..	$0, 0, z$	no extra conditions

Symmetry of special projections

Along [001] $p4$
 $\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$
Origin at 0,0,z

Along [100] $p1m1$
 $\mathbf{a}' = \mathbf{b}$ $\mathbf{b}' = \mathbf{c}$
Origin at $x, 0, 0$

Along [110] $p1m1$
 $\mathbf{a}' = \frac{1}{2}(-\mathbf{a} + \mathbf{b})$ $\mathbf{b}' = \mathbf{c}$
Origin at $x, x, 0$

Maximal non-isomorphic subgroups

I [2] $P2(3)$ 1; 2

IIa none

IIb [2] $P4_2(\mathbf{c}' = 2\mathbf{c})(77)$; [2] $F4(\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}, \mathbf{c}' = 2\mathbf{c})(I4, 79)$

Maximal isomorphic subgroups of lowest index

IIc [2] $P4(\mathbf{c}' = 2\mathbf{c})(75)$; [2] $C4(\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b})(P4, 75)$

Minimal non-isomorphic supergroups

I [2] $P4/m(83)$; [2] $P4/n(85)$; [2] $P422(89)$; [2] $P4_22(90)$; [2] $P4mm(99)$; [2] $P4bm(100)$; [2] $P4cc(103)$; [2] $P4nc(104)$

II [2] $I4(79)$