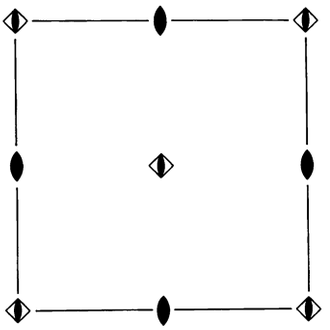
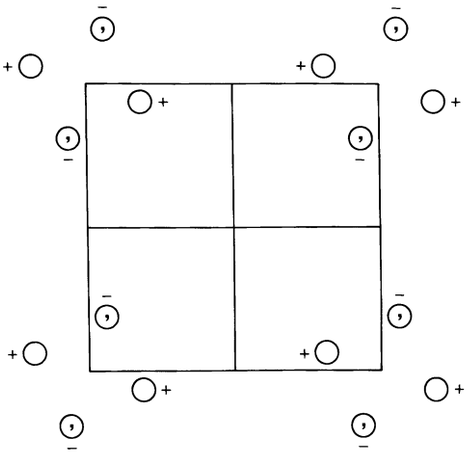
$P\bar{4}$ S_4^1 $\bar{4}$ Tetragonal

No. 81 $P\bar{4}$ Patterson symmetry $P4/m$





Origin at $\bar{4}$

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

Symmetry operations

(1) 1 (2) 2 0,0,z (3) $\bar{4}^+$ 0,0,z; 0,0,0 (4) $\bar{4}^-$ 0,0,z; 0,0,0

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
							General:
4	h	1	(1) x,y,z	(2) $\bar{x},\bar{y},z$	(3) $y,\bar{x},\bar{z}$	(4) $\bar{y},x,\bar{z}$	no conditions
							Special:
2	g	2 . .	$0,\frac{1}{2},z$	$\frac{1}{2},0,\bar{z}$			$hk0:\ h+k=2n$
2	f	2 . .	$\frac{1}{2},\frac{1}{2},z$	$\frac{1}{2},\frac{1}{2},\bar{z}$			no extra conditions
2	e	2 . .	$0,0,z$	$0,0,\bar{z}$			no extra conditions
1	d	$\bar{4}$ . .	$\frac{1}{2},\frac{1}{2},\frac{1}{2}$				no extra conditions
1	c	$\bar{4}$ . .	$\frac{1}{2},\frac{1}{2},0$				no extra conditions
1	b	$\bar{4}$ . .	$0,0,\frac{1}{2}$				no extra conditions
1	a	$\bar{4}$ . .	$0,0,0$				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] $F\bar{4}$ ($\mathbf{a}'=2\mathbf{a},\mathbf{b}'=2\mathbf{b},\mathbf{c}'=2\mathbf{c}$) ($I\bar{4}$, 82)

Maximal isomorphic subgroups of lowest index

IIc [2] $P\bar{4}$ ($\mathbf{c}'=2\mathbf{c}$) (81); [2] $C\bar{4}$ ($\mathbf{a}'=2\mathbf{a},\mathbf{b}'=2\mathbf{b}$) ($P\bar{4}$, 81)

Minimal non-isomorphic supergroups

I [2] $P4/m$ (83); [2] $P4_2/m$ (84); [2] $P4/n$ (85); [2] $P4_2/n$ (86); [2] $P\bar{4}2m$ (111); [2] $P\bar{4}2c$ (112); [2] $P\bar{4}2_1m$ (113); [2] $P\bar{4}2_1c$ (114); [2] $P\bar{4}m2$ (115); [2] $P\bar{4}c2$ (116); [2] $P\bar{4}b2$ (117); [2] $P\bar{4}n2$ (118)

II [2] $I\bar{4}$ (82)