

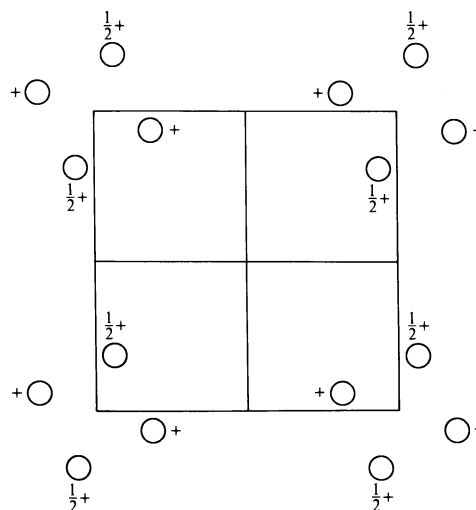
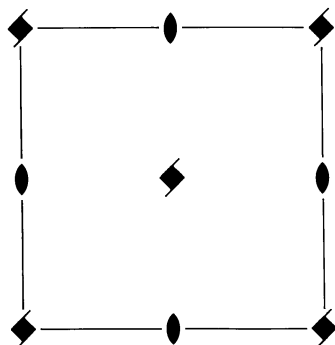
$P4_2$
 C_4^3

4

Tetragonal

No. 77

 $P4_2$

 Patterson symmetry $P4/m$

Origin on 2 on 4_2
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) $4^+(0,0,\frac{1}{2})$ $0,0,z$ (4) $4^-(0,0,\frac{1}{2})$ $0,0,z$
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) $\bar{y},x,z+\frac{1}{2}$	(4) $y,\bar{x},z+\frac{1}{2}$	
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 $00l : l = 2n$

2	<i>c</i>	2..	$0,\frac{1}{2},z$	$\frac{1}{2},0,z+\frac{1}{2}$			
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Special: as above, plus

 $hkl : h+k+l = 2n$

2	<i>b</i>	2..	$\frac{1}{2},\frac{1}{2},z$	$\frac{1}{2},\frac{1}{2},z+\frac{1}{2}$			
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 $hkl : l = 2n$

2	<i>a</i>	2..	$0,0,z$	$0,0,z+\frac{1}{2}$			
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 $hkl : l = 2n$
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] $P4_3(\mathbf{c}' = 2\mathbf{c})(78)$; [2] $P4_1(\mathbf{c}' = 2\mathbf{c})(76)$; [2] $F4_1(\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}, \mathbf{c}' = 2\mathbf{c})(I4_1, 80)$
Maximal isomorphic subgroups of lowest index
IIc [2] $C4_2(\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b})(P4_2, 77)$; [3] $P4_2(\mathbf{c}' = 3\mathbf{c})(77)$
Minimal non-isomorphic supergroups
I [2] $P4_2/m(84)$; [2] $P4_2/n(86)$; [2] $P4_222(93)$; [2] $P4_22_12(94)$; [2] $P4_2cm(101)$; [2] $P4_2nm(102)$; [2] $P4_2mc(105)$; [2] $P4_2bc(106)$
II [2] $I4(79)$; [2] $P4(\mathbf{c}' = \frac{1}{2}\mathbf{c})(75)$