$P4bm$
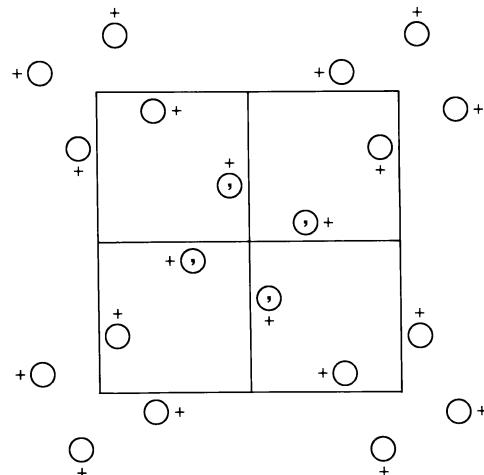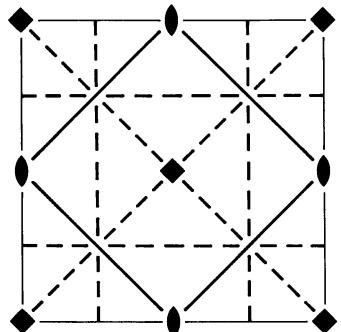
C_{4v}^2

$4mm$

Tetragonal

No. 100

$P4bm$

Origin on $41g$

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

Symmetry operations

(1) 1

(2) 2 $\quad 0,0,z$

(3) $4^+ \quad 0,0,z$

(4) $4^- \quad 0,0,z$

(5) $a \quad x,\frac{1}{4},z$

(6) $b \quad \frac{1}{4},y,z$

(7) $m \quad x+\frac{1}{2},\bar{x},z$

(8) $g(\frac{1}{2},\frac{1}{2},0) \quad x,x,z$

Generators selected   (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				Reflection conditions

General:

8   d 1   (1) x,y,z (2) $\bar{x},\bar{y},z$ (3) $\bar{y},x,z$ (4) $y,\bar{x},z$ $0kl : k=2n$

               (5) $x+\frac{1}{2},\bar{y}+\frac{1}{2},z$ (6) $\bar{x}+\frac{1}{2},y+\frac{1}{2},z$ (7) $\bar{y}+\frac{1}{2},\bar{x}+\frac{1}{2},z$ (8) $y+\frac{1}{2},x+\frac{1}{2},z$ $h00 : h=2n$

Special: as above, plus

4   c $. . m$ $x,x+\frac{1}{2},z$ $\bar{x},\bar{x}+\frac{1}{2},z$ $\bar{x}+\frac{1}{2},x,z$ $x+\frac{1}{2},\bar{x},z$ no extra conditions

2   b $2 . mm$ $\frac{1}{2},0,z$ $0,\frac{1}{2},z$ $hkl : h+k=2n$

2   a $4 . .$ $0,0,z$ $\frac{1}{2},\frac{1}{2},z$ $hkl : h+k=2n$

Symmetry of special projections

Along $[001]$ $p4gm$ Along $[100]$ $p1m1$ Along $[110]$ $p1m1$

$\mathbf{a}'=\mathbf{a}$ $\mathbf{b}'=\mathbf{b}$ $\mathbf{a}'=\frac{1}{2}\mathbf{b}$ $\mathbf{b}'=\mathbf{c}$ $\mathbf{a}'=\frac{1}{2}(-\mathbf{a}+\mathbf{b})$ $\mathbf{b}'=\mathbf{c}$

Origin at $0,0,z$ Origin at $x,0,0$ Origin at $x,x,0$

Maximal non-isomorphic subgroups

I   [2] $P411$ ($P4$, 75)   1; 2; 3; 4

         [2] $P21m$ ($Cmm2$, 35)   1; 2; 7; 8

         [2] $P2b1$ ($Pba2$, 32)   1; 2; 5; 6

IIa   none

IIb   [2] $P4_2bc$ ($\mathbf{c}'=2\mathbf{c}$) (106); [2] $P4nc$ ($\mathbf{c}'=2\mathbf{c}$) (104); [2] $P4_2nm$ ($\mathbf{c}'=2\mathbf{c}$) (102)

Maximal isomorphic subgroups of lowest index

IIc   [2] $P4bm$ ($\mathbf{c}'=2\mathbf{c}$) (100); [9] $P4bm$ ($\mathbf{a}'=3\mathbf{a}, \mathbf{b}'=3\mathbf{b}$) (100)

Minimal non-isomorphic supergroups

I   [2] $P4/nbm$ (125); [2] $P4/mbm$ (127)

II   [2] $C4mm$ ($P4mm$, 99); [2] $I4cm$ (108)