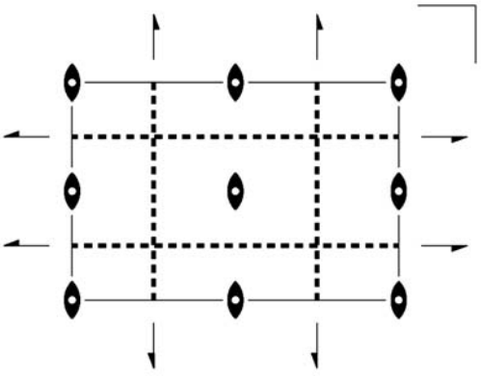
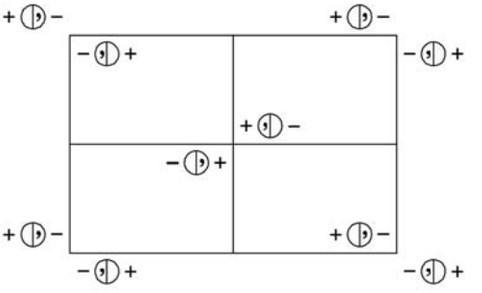
$pbam$ mmm Orthorhombic/Rectangular

No. 44 $p2_1/b2_1/a2/m$ Patterson symmetry $pmmm$





Origin at centre $(2/m)$

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

Symmetry operations

(1) 1 $(1|0,0,0)$

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

(3) $2(0,\frac{1}{2},0) \quad \frac{1}{4},y,0$ $(2_y|\frac{1}{2},\frac{1}{2},0)$

(4) $2(\frac{1}{2},0,0) \quad x,\frac{1}{4},0$ $(2_x|\frac{1}{2},\frac{1}{2},0)$

(5) $\bar{1} \quad 0,0,0$ $(\bar{1}|0,0,0)$

(6) $m \quad x,y,0$ $(m_z|0,0,0)$

(7) $a \quad x,\frac{1}{4},z$ $(m_y|\frac{1}{2},\frac{1}{2},0)$

(8) $b \quad \frac{1}{4},y,z$ $(m_x|\frac{1}{2},\frac{1}{2},0)$

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

Positions

Multiplicity, Wyckoff letter, Site symmetry			Coordinates				Reflection conditions
							General:
8	*f*	1	(1) x,y,z (5) $\bar{x},\bar{y},\bar{z}$	(2) $\bar{x},\bar{y},z$ (6) $x,y,\bar{z}$	(3) $\bar{x}+\frac{1}{2},y+\frac{1}{2},\bar{z}$ (7) $x+\frac{1}{2},\bar{y}+\frac{1}{2},z$	(4) $x+\frac{1}{2},\bar{y}+\frac{1}{2},\bar{z}$ (8) $\bar{x}+\frac{1}{2},y+\frac{1}{2},z$	$0k$: $k=2n$ $h0$: $h=2n$
							Special: as above, plus
4	*e*	. . *m*	$x,y,0$	$\bar{x},\bar{y},0$	$\bar{x}+\frac{1}{2},y+\frac{1}{2},0$	$x+\frac{1}{2},\bar{y}+\frac{1}{2},0$	no extra conditions
4	*d*	. . 2	$0,\frac{1}{2},z$	$\frac{1}{2},0,\bar{z}$	$0,\frac{1}{2},\bar{z}$	$\frac{1}{2},0,z$	hk : $h+k=2n$
4	*c*	. . 2	$0,0,z$	$\frac{1}{2},\frac{1}{2},\bar{z}$	$0,0,\bar{z}$	$\frac{1}{2},\frac{1}{2},z$	hk : $h+k=2n$
2	*b*	. . $2/m$	$0,\frac{1}{2},0$	$\frac{1}{2},0,0$			hk : $h+k=2n$
2	*a*	. . $2/m$	$0,0,0$	$\frac{1}{2},\frac{1}{2},0$			hk : $h+k=2n$

Symmetry of special projections

Along [001] $p2gg$
$\mathbf{a}'=\mathbf{a}$ $\mathbf{b}'=\mathbf{b}$
Origin at $0,0,z$

Along [100] $\not p2mm$
$\mathbf{a}'=\frac{1}{2}\mathbf{b}$
Origin at $x,0,0$

Along [010] $\not p2mm$
$\mathbf{a}'=\frac{1}{2}\mathbf{a}$
Origin at $0,y,0$

Maximal non-isotypic subgroups

I [2] $pb2_1m$ (29) 1; 3; 6; 8
[2] $p2_1am$ ($pb2_1m$, 29) 1; 4; 6; 7
[2] $pba2$ (25) 1; 2; 7; 8
[2] $p2_12_12$ (21) 1; 2; 3; 4
[2] $p12_1/a1$ ($p2_1/b11$, 17) 1; 3; 5; 7
[2] $p2_1/b11$ (17) 1; 4; 5; 8
[2] $p112/m$ (6) 1; 2; 5; 6

IIa none

IIb none

Maximal isotypic subgroups of lowest index

IIc [3] $pbam$ ($\mathbf{a}'=3\mathbf{a}$ or $\mathbf{b}'=3\mathbf{b}$) (44)

Minimal non-isotypic supergroups

I [2] $p4/mbm$ (63)

II [2] $cmmm$ (47); [2] $pmam$ ($\mathbf{b}'=\frac{1}{2}\mathbf{b}$) (40)