

*Imm*2

C_{2v}^{20}

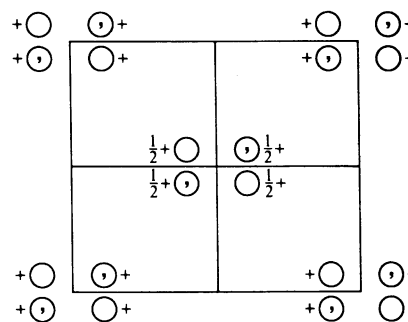
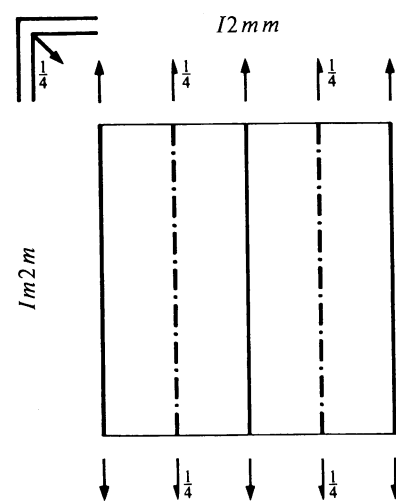
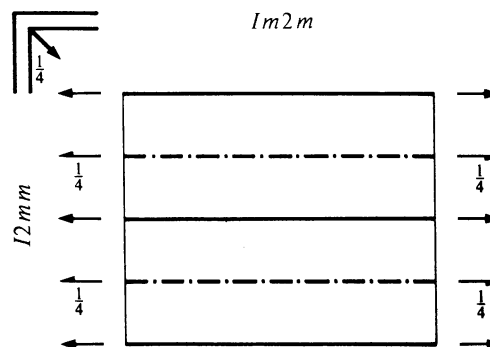
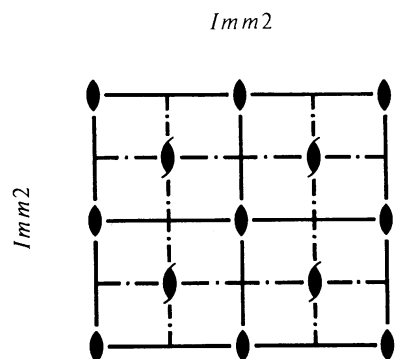
*mm*2

Orthorhombic

No. 44

*Imm*2

Patterson symmetry *Immm*



Origin on *mm*2

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

Symmetry operations

For (0,0,0)+ set

- (1) 1 (2) $2 \quad 0,0,z$ (3) $m \quad x,0,z$ (4) $m \quad 0,y,z$

For $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$ + set

- (1) $t(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$ (2) $2(0,0,\frac{1}{2}) \quad \frac{1}{4}, \frac{1}{4}, z$ (3) $n(\frac{1}{2}, 0, \frac{1}{2}) \quad x, \frac{1}{4}, z$ (4) $n(0, \frac{1}{2}, \frac{1}{2}) \quad \frac{1}{4}, y, z$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				Reflection conditions
	$(0,0,0)+ (\frac{1}{2}, \frac{1}{2}, \frac{1}{2})+$				General:
8 <i>e</i> 1	(1) x,y,z	(2) \bar{x},\bar{y},z	(3) x,\bar{y},z	(4) \bar{x},y,z	$hkl : h+k+l = 2n$ $0kl : k+l = 2n$ $h0l : h+l = 2n$ $hk0 : h+k = 2n$ $h00 : h = 2n$ $0k0 : k = 2n$ $00l : l = 2n$
4 <i>d</i> <i>m</i> . .	$0,y,z$	$0,\bar{y},z$			Special: no extra conditions
4 <i>c</i> . <i>m</i> .	$x,0,z$	$\bar{x},0,z$			
2 <i>b</i> <i>m m</i> 2	$0, \frac{1}{2}, z$				
2 <i>a</i> <i>m m</i> 2	$0,0,z$				

Symmetry of special projections

Along [001] *c 2 m m*

$\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$

Origin at 0,0,z

Along [100] *c 1 m 1*

$\mathbf{a}' = \mathbf{b}$ $\mathbf{b}' = \mathbf{c}$

Origin at $x,0,0$

Along [010] *c 1 1 m*

$\mathbf{a}' = \mathbf{c}$ $\mathbf{b}' = \mathbf{a}$

Origin at 0,y,0

Maximal non-isomorphic subgroups

I	[2] <i>I 1 m 1</i> (<i>Cm</i> , 8)	(1; 3)+
	[2] <i>Im 1 1</i> (<i>Cm</i> , 8)	(1; 4)+
	[2] <i>I 1 1 2</i> (<i>C2</i> , 5)	(1; 2)+
IIa	[2] <i>Pnn2</i> (34)	1; 2; (3; 4) + $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$
	[2] <i>Pnm2</i> ₁ (<i>Pmn2</i> ₁ , 31)	1; 3; (2; 4) + $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$
	[2] <i>Pmn2</i> ₁ (31)	1; 4; (2; 3) + $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$
	[2] <i>Pmm2</i> (25)	1; 2; 3; 4
IIb	none	

Maximal isomorphic subgroups of lowest index

IIc [3] *Imm2* ($\mathbf{a}' = 3\mathbf{a}$ or $\mathbf{b}' = 3\mathbf{b}$) (44); [3] *Imm2* ($\mathbf{c}' = 3\mathbf{c}$) (44)

Minimal non-isomorphic supergroups

I	[2] <i>Immm</i> (71); [2] <i>Imma</i> (74); [2] <i>I4mm</i> (107); [2] <i>I4, md</i> (109); [2] <i>I4m2</i> (119)
II	[2] <i>Cmm2</i> ($\mathbf{c}' = \frac{1}{2}\mathbf{c}$) (35); [2] <i>Amm2</i> ($\mathbf{a}' = \frac{1}{2}\mathbf{a}$) (38); [2] <i>Bmm2</i> ($\mathbf{b}' = \frac{1}{2}\mathbf{b}$) (<i>Amm2</i> , 38)