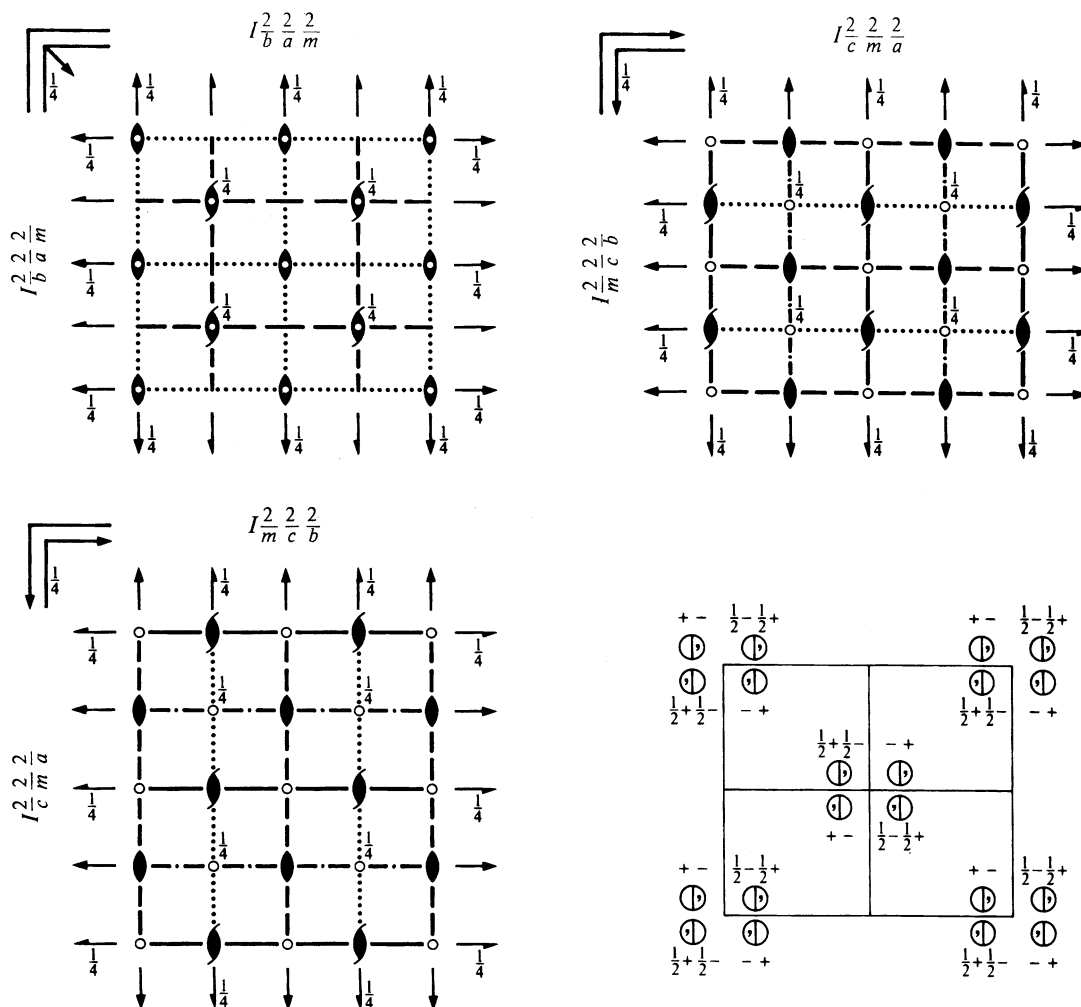


$Ibam$
 D_{2h}^{26}
 mmm

Orthorhombic

No. 72

 $I 2/b 2/a 2/m$

 Patterson symmetry $Immm$

Origin at centre ($2/m$) at $cc2/m$
Asymmetric unit $0 \leq x \leq \frac{1}{4}$; $0 \leq y \leq \frac{1}{2}$; $0 \leq z \leq \frac{1}{2}$
Symmetry operations

 For $(0,0,0)+$ set

- | | | | |
|-----------------------|-------------------|---|---|
| (1) 1 | (2) 2 $0,0,z$ | (3) 2 $(0, \frac{1}{2}, 0)$ $\frac{1}{4}, y, 0$ | (4) 2 $(\frac{1}{2}, 0, 0)$ $x, \frac{1}{4}, 0$ |
| (5) $\bar{1}$ $0,0,0$ | (6) m $x, y, 0$ | (7) a $x, \frac{1}{4}, z$ | (8) b $\frac{1}{4}, y, z$ |

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

- | | | | |
|---|---|---------------------------|---------------------------|
| (1) $t(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$ | (2) 2 $(0, 0, \frac{1}{2})$ $\frac{1}{4}, \frac{1}{4}, z$ | (3) 2 $0, y, \frac{1}{4}$ | (4) 2 $x, 0, \frac{1}{4}$ |
| (5) $\bar{1}$ $\frac{1}{4}, \frac{1}{4}, \frac{1}{4}$ | (6) $n(\frac{1}{2}, \frac{1}{2}, 0)$ $x, y, \frac{1}{4}$ | (7) c $x, 0, z$ | (8) c $0, y, z$ |

Maximal isomorphic subgroups of lowest index
IIc [3] $Ibam$ ($\mathbf{a}' = 3\mathbf{a}$ or $\mathbf{b}' = 3\mathbf{b}$) (72); [3] $Ibam$ ($\mathbf{c}' = 3\mathbf{c}$) (72)

Minimal non-isomorphic supergroups
I [2] $I4/mcm$ (140)

II [2] $Cmmm$ ($\mathbf{c}' = \frac{1}{2}\mathbf{c}$) (65); [2] $Aemm$ ($\mathbf{a}' = \frac{1}{2}\mathbf{a}$) ($Cmme$, 67); [2] $Bmem$ ($\mathbf{b}' = \frac{1}{2}\mathbf{b}$) ($Cmme$, 67)

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); (5)

Positions

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

Symmetry of special projections

Along [001] $c2mm$
 $\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$
Origin at 0,0,z

Along [100] $p2mm$
 $\mathbf{a}' = \frac{1}{2}\mathbf{b}$ $\mathbf{b}' = \frac{1}{2}\mathbf{c}$
Origin at x,0,0

Along [010] $p2mm$
 $\mathbf{a}' = \frac{1}{2}\mathbf{c}$ $\mathbf{b}' = \frac{1}{2}\mathbf{a}$
Origin at 0,y,0

Maximal non-isomorphic subgroups

I	[2] <i>Ib2m</i> (<i>Ima2</i> , 46)	(1; 3; 6; 8)+
	[2] <i>I2am</i> (<i>Ima2</i> , 46)	(1; 4; 6; 7)+
	[2] <i>Iba2</i> (45)	(1; 2; 7; 8)+
	[2] <i>I222</i> (23)	(1; 2; 3; 4)+
	[2] <i>I12/a1</i> (<i>C2/c</i> , 15)	(1; 3; 5; 7)+
	[2] <i>I2/b11</i> (<i>C2/c</i> , 15)	(1; 4; 5; 8)+
	[2] <i>I112/m</i> (<i>C2/m</i> , 12)	(1; 2; 5; 6)+
IIa	[2] <i>Pcan</i> (<i>Pbcn</i> , 60)	1; 3; 5; 7; (2; 4; 6; 8) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$
	[2] <i>Pbcn</i> (60)	1; 4; 5; 8; (2; 3; 6; 7) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$
	[2] <i>Pbcm</i> (57)	1; 3; 6; 8; (2; 4; 5; 7) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$
	[2] <i>Pcam</i> (<i>Pbcm</i> , 57)	1; 4; 6; 7; (2; 3; 5; 8) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$
	[2] <i>Pccn</i> (56)	1; 2; 3; 4; (5; 6; 7; 8) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$
	[2] <i>Pbam</i> (55)	1; 2; 3; 4; 5; 6; 7; 8
	[2] <i>Pban</i> (50)	1; 2; 7; 8; (3; 4; 5; 6) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$
	[2] <i>Pccm</i> (49)	1; 2; 5; 6; (3; 4; 7; 8) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$
IIb	none	

(Continued on preceding page)