

$Cmm2$

C_{2v}^{11}

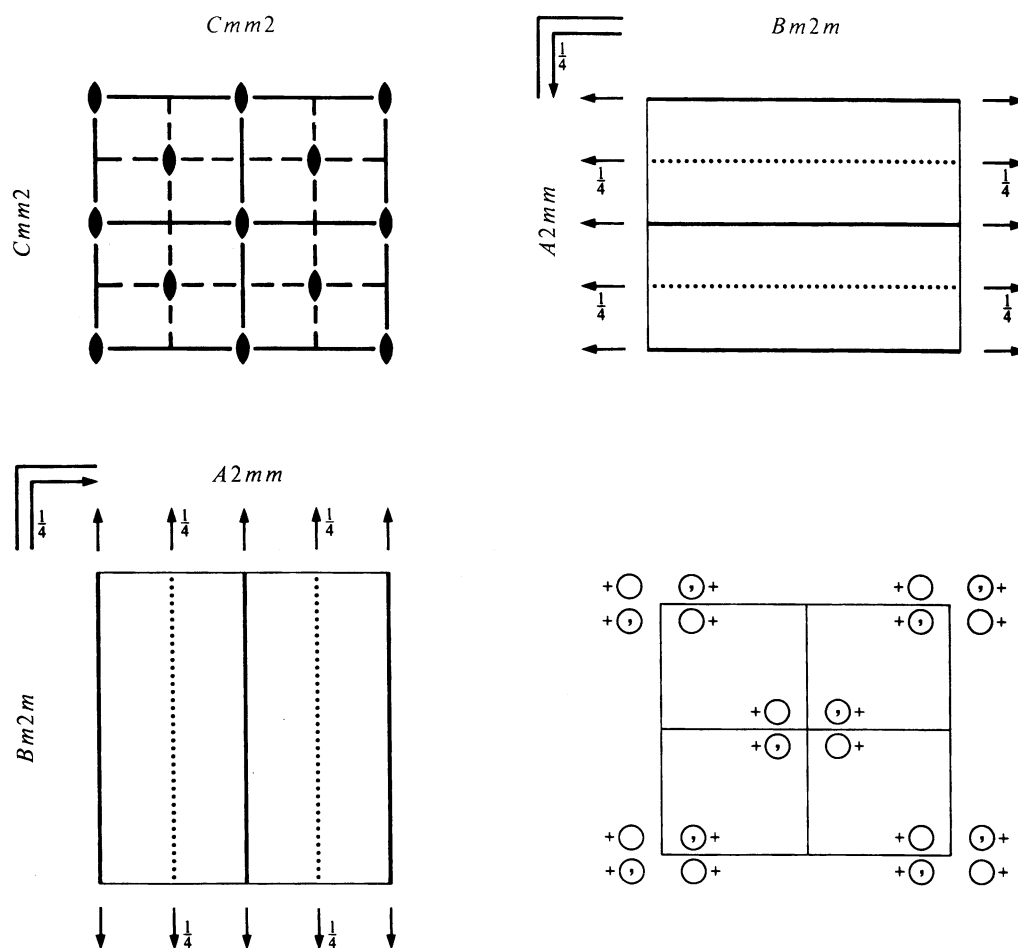
$mm2$

Orthorhombic

No. 35

$Cmm2$

Patterson symmetry $Cmmm$



Origin on $mm2$

Asymmetric unit $0 \leq x \leq \frac{1}{4}$; $0 \leq y \leq \frac{1}{2}$; $0 \leq z \leq 1$

Symmetry operations

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

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

For $(\frac{1}{2},\frac{1}{2},0)+$ set

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

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

Positions

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

Symmetry of special projections

Along [001] *c*2*mm*
 $\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$
 Origin at 0,0,z

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

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

Maximal non-isomorphic subgroups

I	[2] <i>C</i> 1 <i>m</i> 1 (<i>Cm</i> , 8)	(1; 3)+
	[2] <i>C</i> <i>m</i> 11 (<i>Cm</i> , 8)	(1; 4)+
	[2] <i>C</i> 112 (<i>P</i> 2, 3)	(1; 2)+
IIa	[2] <i>P</i> <i>b</i> <i>a</i> 2 (32)	1; 2; (3; 4) + $(\frac{1}{2},\frac{1}{2},0)$
	[2] <i>P</i> <i>b</i> <i>m</i> 2 (<i>P</i> <i>m</i> <i>a</i> 2, 28)	1; 3; (2; 4) + $(\frac{1}{2},\frac{1}{2},0)$
	[2] <i>P</i> <i>m</i> <i>a</i> 2 (28)	1; 4; (2; 3) + $(\frac{1}{2},\frac{1}{2},0)$
	[2] <i>P</i> <i>m</i> <i>m</i> 2 (25)	1; 2; 3; 4
IIb	[2] <i>I</i> <i>m</i> <i>a</i> 2 ($\mathbf{c}' = 2\mathbf{c}$) (46); [2] <i>I</i> <i>b</i> <i>m</i> 2 ($\mathbf{c}' = 2\mathbf{c}$) (<i>I</i> <i>m</i> <i>a</i> 2, 46); [2] <i>I</i> <i>b</i> <i>a</i> 2 ($\mathbf{c}' = 2\mathbf{c}$) (45); [2] <i>I</i> <i>m</i> <i>m</i> 2 ($\mathbf{c}' = 2\mathbf{c}$) (44); [2] <i>C</i> <i>c</i> <i>c</i> 2 ($\mathbf{c}' = 2\mathbf{c}$) (37); [2] <i>C</i> <i>m</i> <i>c</i> 2 ($\mathbf{c}' = 2\mathbf{c}$) (36); [2] <i>C</i> <i>c</i> <i>m</i> 2 ($\mathbf{c}' = 2\mathbf{c}$) (<i>C</i> <i>m</i> <i>c</i> 2, 36)	

Maximal isomorphic subgroups of lowest index

IIc [2] *C**m**m*2 ($\mathbf{c}' = 2\mathbf{c}$) (35); [3] *C**m**m*2 ($\mathbf{a}' = 3\mathbf{a}$ or $\mathbf{b}' = 3\mathbf{b}$) (35)

Minimal non-isomorphic supergroups

I	[2] <i>C</i> <i>m</i> <i>m</i> <i>m</i> (65); [2] <i>C</i> <i>m</i> <i>m</i> <i>e</i> (67); [2] <i>P</i> 4 <i>m</i> <i>m</i> (99); [2] <i>P</i> 4 <i>b</i> <i>m</i> (100); [2] <i>P</i> 4 ₂ <i>c</i> <i>m</i> (101); [2] <i>P</i> 4 ₂ <i>n</i> <i>m</i> (102); [2] <i>P</i> 4̄2 <i>m</i> (111); [2] <i>P</i> 4̄2 ₁ <i>m</i> (113); [3] <i>P</i> 6 <i>m</i> <i>m</i> (183)
II	[2] <i>F</i> <i>m</i> <i>m</i> 2 (42); [2] <i>P</i> <i>m</i> <i>m</i> 2 ($\mathbf{a}' = \frac{1}{2}\mathbf{a}$, $\mathbf{b}' = \frac{1}{2}\mathbf{b}$) (25)