

$C222_1$

D_2^5

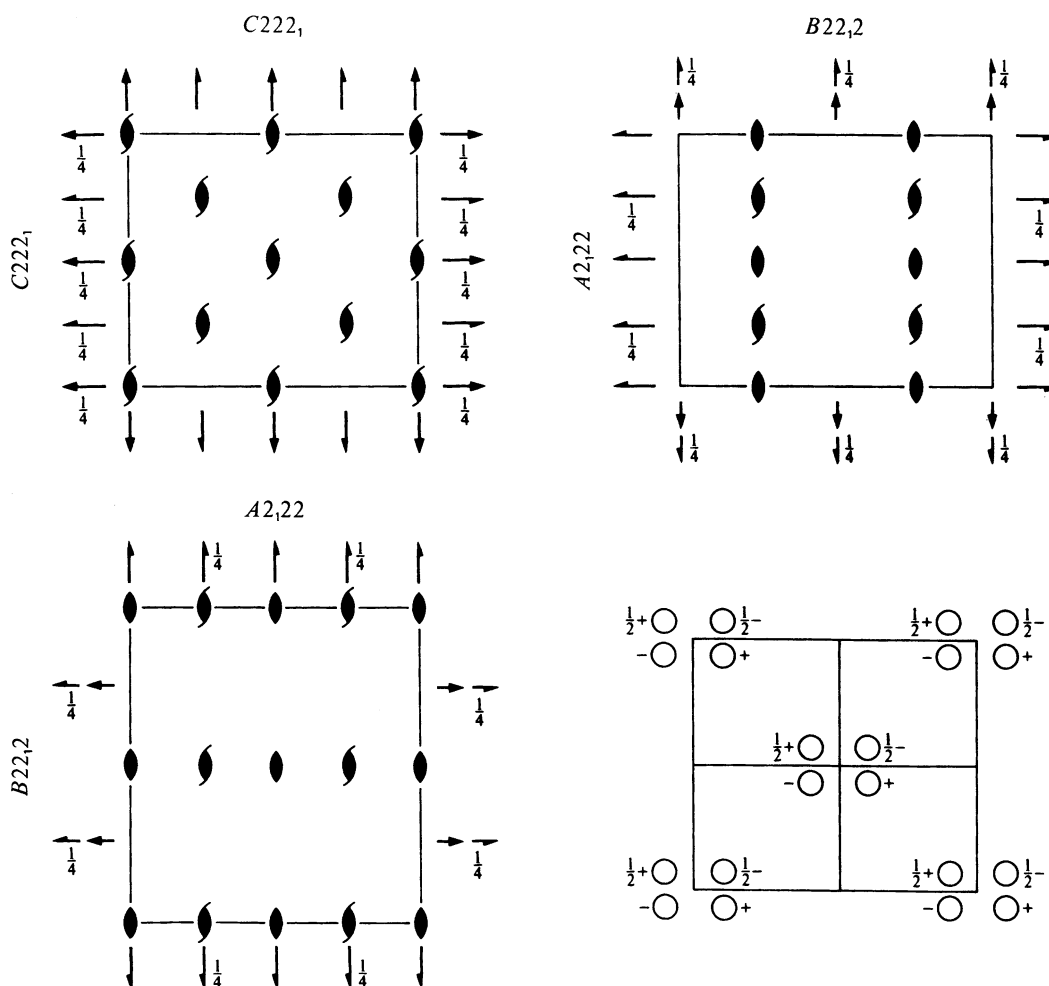
222

Orthorhombic

No. 20

$C222_1$

Patterson symmetry $Cmmm$



Origin at 212_1

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

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

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

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 c 1	(1) x,y,z	(2) $\bar{x},\bar{y},z+\frac{1}{2}$	(3) $\bar{x},y,\bar{z}+\frac{1}{2}$	(4) x,\bar{y},\bar{z}	$hkl : h+k=2n$ $0kl : k=2n$ $h0l : h=2n$ $hk0 : h+k=2n$ $h00 : h=2n$ $0k0 : k=2n$ $00l : l=2n$
4 b .2.	$0,y,\frac{1}{4}$	$0,\bar{y},\frac{3}{4}$			Special: as above, plus $h0l : l=2n$
4 a 2..	$x,0,0$	$\bar{x},0,\frac{1}{2}$			$0kl : l=2n$

Symmetry of special projections

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

Along [100] $p2gm$
 $\mathbf{a}' = \frac{1}{2}\mathbf{b}$ $\mathbf{b}' = \mathbf{c}$
 Origin at x,0,0

Along [010] $p2mg$
 $\mathbf{a}' = \mathbf{c}$ $\mathbf{b}' = \frac{1}{2}\mathbf{a}$
 Origin at 0,y, $\frac{1}{4}$

Maximal non-isomorphic subgroups

I	[2] $C121 (C2, 5)$	(1; 3)+
	[2] $C211 (C2, 5)$	(1; 4)+
	[2] $C112_1 (P2_1, 4)$	(1; 2)+
IIa	[2] $P2_12_12_1 (19)$	1; 2; (3; 4) + $(\frac{1}{2},\frac{1}{2},0)$
	[2] $P2_12_2 (P2_12_12, 18)$	1; 3; (2; 4) + $(\frac{1}{2},\frac{1}{2},0)$
	[2] $P22_12_1 (P2_12_12, 18)$	1; 4; (2; 3) + $(\frac{1}{2},\frac{1}{2},0)$
	[2] $P222_1 (17)$	1; 2; 3; 4
IIb	none	

Maximal isomorphic subgroups of lowest index

IIc [3] $C222_1 (\mathbf{a}' = 3\mathbf{a}$ or $\mathbf{b}' = 3\mathbf{b}) (20)$; [3] $C222_1 (\mathbf{c}' = 3\mathbf{c}) (20)$

Minimal non-isomorphic supergroups

I	[2] $Cmcm (63)$; [2] $Cmce (64)$; [2] $P4_122 (91)$; [2] $P4_12_12 (92)$; [2] $P4_322 (95)$; [2] $P4_32_12 (96)$; [3] $P6_122 (178)$; [3] $P6_522 (179)$; [3] $P6_322 (182)$
II	[2] $F222 (22)$; [2] $P222_1 (\mathbf{a}' = \frac{1}{2}\mathbf{a}, \mathbf{b}' = \frac{1}{2}\mathbf{b}) (17)$; [2] $C222 (\mathbf{c}' = \frac{1}{2}\mathbf{c}) (21)$