

$P222_1$

No. 17

$P222_1$

D_2^2

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

General position

Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

4 e 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}

I Maximal translationengleiche subgroups

[2] $P112_1$ (4)	1; 2		
[2] $P121$ (3)	1; 3		0, 0, 1/4
[2] $P211$ (3, $P121$)	1; 4	c, a, b	

II Maximal klassengleiche subgroups

• Enlarged unit cell

[2] $\mathbf{a}' = 2\mathbf{a}$			
$P2_122_1$ (18, $P2_12_12$)	$\langle 2; 3 + (1, 0, 0) \rangle$	c, 2a, b	1/2, 0, 1/4
$P2_122_1$ (18, $P2_12_12$)	$\langle 3; 2 + (1, 0, 0) \rangle$	c, 2a, b	0, 0, 1/4
$P222_1$ (17)	$\langle 2; 3 \rangle$	2a, b, c	
$P222_1$ (17)	$\langle (2; 3) + (1, 0, 0) \rangle$	2a, b, c	1/2, 0, 0
[2] $\mathbf{b}' = 2\mathbf{b}$			
$P22_12_1$ (18, $P2_12_12$)	$\langle 2; 3 + (0, 1, 0) \rangle$	2b, c, a	0, 1/2, 0
$P22_12_1$ (18, $P2_12_12$)	$\langle (2; 3) + (0, 1, 0) \rangle$	2b, c, a	
$P222_1$ (17)	$\langle 2; 3 \rangle$	a, 2b, c	
$P222_1$ (17)	$\langle 3; 2 + (0, 1, 0) \rangle$	a, 2b, c	0, 1/2, 0
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$			
$C222_1$ (20)	$\langle 2; 3 \rangle$	2a, 2b, c	
$C222_1$ (20)	$\langle (2; 3) + (1, 0, 0) \rangle$	2a, 2b, c	1/2, 0, 0
$C222_1$ (20)	$\langle 3; 2 + (0, 1, 0) \rangle$	2a, 2b, c	0, 1/2, 0
$C222_1$ (20)	$\langle 2 + (1, 1, 0); 3 + (1, 0, 0) \rangle$	2a, 2b, c	1/2, 1/2, 0
[3] $\mathbf{a}' = 3\mathbf{a}$			
$P222_1$ (17)	$\langle 2; 3 \rangle$	3a, b, c	
$P222_1$ (17)	$\langle (2; 3) + (2, 0, 0) \rangle$	3a, b, c	1, 0, 0
$P222_1$ (17)	$\langle (2; 3) + (4, 0, 0) \rangle$	3a, b, c	2, 0, 0
[3] $\mathbf{b}' = 3\mathbf{b}$			
$P222_1$ (17)	$\langle 2; 3 \rangle$	a, 3b, c	
$P222_1$ (17)	$\langle 3; 2 + (0, 2, 0) \rangle$	a, 3b, c	0, 1, 0
$P222_1$ (17)	$\langle 3; 2 + (0, 4, 0) \rangle$	a, 3b, c	0, 2, 0
[3] $\mathbf{c}' = 3\mathbf{c}$			
$P222_1$ (17)	$\langle (2; 3) + (0, 0, 1) \rangle$	a, b, 3c	
$P222_1$ (17)	$\langle 2 + (0, 0, 1); 3 + (0, 0, 3) \rangle$	a, b, 3c	0, 0, 1
$P222_1$ (17)	$\langle 2 + (0, 0, 1); 3 + (0, 0, 5) \rangle$	a, b, 3c	0, 0, 2

• Series of maximal isomorphic subgroups

[p] $\mathbf{a}' = p\mathbf{a}$			
$P222_1$ (17)	$\langle (2; 3) + (2u, 0, 0) \rangle$	pa, b, c	$u, 0, 0$
	$p > 2; 0 \leq u < p$		
	p conjugate subgroups for the prime p		
[p] $\mathbf{b}' = p\mathbf{b}$			
$P222_1$ (17)	$\langle 3; 2 + (0, 2u, 0) \rangle$	a, pb, c	$0, u, 0$
	$p > 2; 0 \leq u < p$		
	p conjugate subgroups for the prime p		
[p] $\mathbf{c}' = p\mathbf{c}$			
$P222_1$ (17)	$\langle 2 + (0, 0, \frac{p}{2} - \frac{1}{2}); 3 + (0, 0, \frac{p}{2} - \frac{1}{2} + 2u) \rangle$	a, b, pc	$0, 0, u$
	$p > 2; 0 \leq u < p$		
	p conjugate subgroups for the prime p		

I Minimal translationengleiche supergroups

[2] $Pmna$ (51); [2] $Pnna$ (52); [2] $Pmna$ (53); [2] $Pcca$ (54); [2] $P4_122$ (91); [2] $P4_322$ (95)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

[2] $C222_1$ (20); [2] $A222$ (21, $C222$); [2] $B222$ (21, $C222$); [2] $I2_12_12_1$ (24)

• Decreased unit cell

[2] $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ $P222$ (16)