

$P222$

No. 16

 $P222$
 D_2^1
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 u 1 (1) x, y, z (2) \bar{x}, \bar{y}, z (3) \bar{x}, y, \bar{z} (4) x, \bar{y}, \bar{z}
I Maximal translationengleiche subgroups

[2] $P112$ (3)	1; 2	
[2] $P121$ (3)	1; 3	
[2] $P211$ (3, $P121$)	1; 4	c, a, b

II Maximal klassengleiche subgroups

• Enlarged unit cell

[2] $\mathbf{a}' = 2\mathbf{a}$			
$P2_122$ (17, $P222_1$)	$\langle 3; 2 + (1,0,0) \rangle$	b, c, 2a	
$P2_122$ (17, $P222_1$)	$\langle 2; 3 + (1,0,0) \rangle$	b, c, 2a	1/2, 0, 0
$P222$ (16)	$\langle 2; 3 \rangle$	2a, b, c	
$P222$ (16)	$\langle (2; 3) + (1,0,0) \rangle$	2a, b, c	1/2, 0, 0
[2] $\mathbf{b}' = 2\mathbf{b}$			
$P22_12$ (17, $P222_1$)	$\langle 2; 3 + (0,1,0) \rangle$	c, a, 2b	
$P22_12$ (17, $P222_1$)	$\langle (2; 3) + (0,1,0) \rangle$	c, a, 2b	0, 1/2, 0
$P222$ (16)	$\langle 2; 3 \rangle$	a, 2b, c	
$P222$ (16)	$\langle 3; 2 + (0,1,0) \rangle$	a, 2b, c	0, 1/2, 0
[2] $\mathbf{c}' = 2\mathbf{c}$			
$P222_1$ (17)	$\langle 3; 2 + (0,0,1) \rangle$	a, b, 2c	0, 0, 1/2
$P222_1$ (17)	$\langle (2; 3) + (0,0,1) \rangle$	a, b, 2c	
$P222$ (16)	$\langle 2; 3 \rangle$	a, b, 2c	
$P222$ (16)	$\langle 2; 3 + (0,0,1) \rangle$	a, b, 2c	0, 0, 1/2
[2] $\mathbf{b}' = 2\mathbf{b}, \mathbf{c}' = 2\mathbf{c}$			
$A222$ (21, $C222$)	$\langle 2; 3 \rangle$	2b, 2c, a	
$A222$ (21, $C222$)	$\langle 3; 2 + (0,1,0) \rangle$	2b, 2c, a	0, 1/2, 0
$A222$ (21, $C222$)	$\langle 2; 3 + (0,0,1) \rangle$	2b, 2c, a	0, 0, 1/2
$A222$ (21, $C222$)	$\langle 2 + (0,1,0); 3 + (0,0,1) \rangle$	2b, 2c, a	0, 1/2, 1/2
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{c}' = 2\mathbf{c}$			
$B222$ (21, $C222$)	$\langle 2; 3 \rangle$	2c, 2a, b	
$B222$ (21, $C222$)	$\langle 2; 3 + (0,0,1) \rangle$	2c, 2a, b	0, 0, 1/2
$B222$ (21, $C222$)	$\langle (2; 3) + (1,0,0) \rangle$	2c, 2a, b	1/2, 0, 0
$B222$ (21, $C222$)	$\langle 2 + (1,0,0); 3 + (1,0,1) \rangle$	2c, 2a, b	1/2, 0, 1/2
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$			
$C222$ (21)	$\langle 2; 3 \rangle$	2a, 2b, c	
$C222$ (21)	$\langle (2; 3) + (1,0,0) \rangle$	2a, 2b, c	1/2, 0, 0
$C222$ (21)	$\langle 3; 2 + (0,1,0) \rangle$	2a, 2b, c	0, 1/2, 0
$C222$ (21)	$\langle 2 + (1,1,0); 3 + (1,0,0) \rangle$	2a, 2b, c	1/2, 1/2, 0
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}, \mathbf{c}' = 2\mathbf{c}$			
$F222$ (22)	$\langle 2; 3 \rangle$	2a, 2b, 2c	
$F222$ (22)	$\langle 3; 2 + (0,1,0) \rangle$	2a, 2b, 2c	0, 1/2, 0
$F222$ (22)	$\langle 2; 3 + (0,0,1) \rangle$	2a, 2b, 2c	0, 0, 1/2
$F222$ (22)	$\langle (2; 3) + (1,0,0) \rangle$	2a, 2b, 2c	1/2, 0, 0
[3] $\mathbf{a}' = 3\mathbf{a}$			
$P222$ (16)	$\langle 2; 3 \rangle$	3a, b, c	
$P222$ (16)	$\langle (2; 3) + (2,0,0) \rangle$	3a, b, c	1, 0, 0
$P222$ (16)	$\langle (2; 3) + (4,0,0) \rangle$	3a, b, c	2, 0, 0
[3] $\mathbf{b}' = 3\mathbf{b}$			
$P222$ (16)	$\langle 2; 3 \rangle$	a, 3b, c	
$P222$ (16)	$\langle 3; 2 + (0,2,0) \rangle$	a, 3b, c	0, 1, 0
$P222$ (16)	$\langle 3; 2 + (0,4,0) \rangle$	a, 3b, c	0, 2, 0
[3] $\mathbf{c}' = 3\mathbf{c}$			
$P222$ (16)	$\langle 2; 3 \rangle$	a, b, 3c	
$P222$ (16)	$\langle 2; 3 + (0,0,2) \rangle$	a, b, 3c	0, 0, 1
$P222$ (16)	$\langle 2; 3 + (0,0,4) \rangle$	a, b, 3c	0, 0, 2

- Series of maximal isomorphic subgroups

[p] $\mathbf{a}' = p\mathbf{a}$ P222 (16)	$\langle (2; 3) + (2u, 0, 0) \rangle$ prime $p > 2$; $0 \leq u < p$ p conjugate subgroups	$p\mathbf{a}, \mathbf{b}, \mathbf{c}$	$u, 0, 0$
[p] $\mathbf{b}' = p\mathbf{b}$ P222 (16)	$\langle 3; 2 + (0, 2u, 0) \rangle$ prime $p > 2$; $0 \leq u < p$ p conjugate subgroups	$\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$0, u, 0$
[p] $\mathbf{c}' = p\mathbf{c}$ P222 (16)	$\langle 2; 3 + (0, 0, 2u) \rangle$ prime $p > 2$; $0 \leq u < p$ p conjugate subgroups	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	$0, 0, u$

I Minimal translationengleiche supergroups

[2] $Pmmm$ (47); [2] $Pnnn$ (48); [2] $Pccm$ (49); [2] $Pban$ (50); [2] $P422$ (89); [2] $P4_222$ (93); [2] $P\bar{4}2m$ (111); [2] $P\bar{4}2c$ (112); [3] $P23$ (195)

II Minimal non-isomorphic klassengleiche supergroups

- Additional centring translations

[2] $A222$ (21, $C222$); [2] $B222$ (21, $C222$); [2] $C222$ (21); [2] $I222$ (23)

- Decreased unit cell

none