

D_2^5
 $C222_1$

No. 20

 $C222_1$
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)

General position

 Multiplicity,
Wyckoff letter,
Site symmetry

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

 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}
I Maximal translationengleiche subgroups

[2] C_{121} (5)	$\langle 1; 3 \rangle +$		$0,0,1/4$
[2] C_{211} (5, C_{121})	$\langle 1; 4 \rangle +$	$-\mathbf{b}, \mathbf{a}, \mathbf{c}$	
[2] C_{112}_1 (4, P_{112}_1)	$\langle 1; 2 \rangle +$	$1/2(\mathbf{a}-\mathbf{b}), 1/2(\mathbf{a}+\mathbf{b}), \mathbf{c}$	

II Maximal klassengleiche subgroups

• Loss of centring translations

[2] $P_{21}2_12_1$ (19)	$1; 2; (3; 4) + (\frac{1}{2}, \frac{1}{2}, 0)$		$1/4, 0, 0$
[2] $P_{21}22_1$ (18, $P_{21}2_12$)	$1; 3; (2; 4) + (\frac{1}{2}, \frac{1}{2}, 0)$	$\mathbf{c}, \mathbf{a}, \mathbf{b}$	$0, 1/4, 1/4$
[2] $P_{22}2_12_1$ (18, $P_{21}2_12$)	$1; 4; (2; 3) + (\frac{1}{2}, \frac{1}{2}, 0)$	$\mathbf{b}, \mathbf{c}, \mathbf{a}$	$1/4, 0, 0$
[2] P_{222}_1 (17)	$1; 2; 3; 4$		

• Enlarged unit cell

[3] $\mathbf{a}' = 3\mathbf{a}$			
$\left\{ \begin{array}{l} C_{222}_1 (20) \\ C_{222}_1 (20) \\ C_{222}_1 (20) \end{array} \right.$	$\langle 2; 3 \rangle$ $\langle (2; 3) + (2, 0, 0) \rangle$ $\langle (2; 3) + (4, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$ $3\mathbf{a}, \mathbf{b}, \mathbf{c}$ $3\mathbf{a}, \mathbf{b}, \mathbf{c}$	$1, 0, 0$ $2, 0, 0$
[3] $\mathbf{b}' = 3\mathbf{b}$			
$\left\{ \begin{array}{l} C_{222}_1 (20) \\ C_{222}_1 (20) \\ C_{222}_1 (20) \end{array} \right.$	$\langle 2; 3 \rangle$ $\langle 3; 2 + (0, 2, 0) \rangle$ $\langle 3; 2 + (0, 4, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	$0, 1, 0$ $0, 2, 0$
[3] $\mathbf{c}' = 3\mathbf{c}$			
$\left\{ \begin{array}{l} C_{222}_1 (20) \\ C_{222}_1 (20) \\ C_{222}_1 (20) \end{array} \right.$	$\langle (2; 3) + (0, 0, 1) \rangle$ $\langle 2 + (0, 0, 1); 3 + (0, 0, 3) \rangle$ $\langle 2 + (0, 0, 1); 3 + (0, 0, 5) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$ $\mathbf{a}, \mathbf{b}, 3\mathbf{c}$ $\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	$0, 0, 1$ $0, 0, 2$

• Series of maximal isomorphic subgroups

[p] $\mathbf{a}' = p\mathbf{a}$			
$C_{222}_1 (20)$	$\langle (2; 3) + (2u, 0, 0) \rangle$ $p > 2; 0 \leq u < p$ p conjugate subgroups for the prime p	$p\mathbf{a}, \mathbf{b}, \mathbf{c}$	$u, 0, 0$
[p] $\mathbf{b}' = p\mathbf{b}$			
$C_{222}_1 (20)$	$\langle 3; 2 + (0, 2u, 0) \rangle$ $p > 2; 0 \leq u < p$ p conjugate subgroups for the prime p	$\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$0, u, 0$
[p] $\mathbf{c}' = p\mathbf{c}$			
$C_{222}_1 (20)$	$\langle 2 + (0, 0, \frac{p}{2} - \frac{1}{2}); 3 + (0, 0, \frac{p}{2} - \frac{1}{2} + 2u) \rangle$ $p > 2; 0 \leq u < p$ p conjugate subgroups for the prime p	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	$0, 0, u$

I Minimal translationengleiche supergroups

[2] $Cmcm$ (63); [2] $Cmce$ (64); [2] $P_{41}22$ (91); [2] $P_{41}2_12$ (92); [2] $P_{43}22$ (95); [2] $P_{43}2_12$ (96); [3] $P_{61}22$ (178); [3] $P_{65}22$ (179); [3] $P_{63}22$ (182)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

[2] $F222$ (22)

• Decreased unit cell

[2] $\mathbf{a}' = \frac{1}{2}\mathbf{a}, \mathbf{b}' = \frac{1}{2}\mathbf{b}$ P_{222}_1 (17); [2] $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ C_{222} (21)