

$I2_12_12_1$

No. 24

 $I2_12_12_1$
 D_2^9
Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(\frac{1}{2},\frac{1}{2},\frac{1}{2})$; (2); (3)

General position

 Multiplicity,
Wyckoff letter,
Site symmetry

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

 8 d 1

 (1) x, y, z (2) $\bar{x} + \frac{1}{2}, \bar{y}, z + \frac{1}{2}$ (3) $\bar{x}, y + \frac{1}{2}, \bar{z} + \frac{1}{2}$ (4) $x + \frac{1}{2}, \bar{y} + \frac{1}{2}, \bar{z}$
I Maximal translationengleiche subgroups

[2] $I112_1$ (5, A112)	(1; 2)+	$\mathbf{b}, -\mathbf{a} - \mathbf{b}, \mathbf{c}$	0, 1/4, 0
[2] $I12_11$ (5, C121)	(1; 3)+	$-\mathbf{a} - \mathbf{c}, \mathbf{b}, \mathbf{a}$	1/4, 0, 0
[2] $I2_111$ (5, C121)	(1; 4)+	$-\mathbf{b} - \mathbf{c}, \mathbf{a}, \mathbf{c}$	0, 0, 1/4

II Maximal klassengleiche subgroups

• Loss of centring translations

[2] $P2_12_12_1$ (19)	1; 2; 3; 4		
[2] $P222_1$ (17)	1; 2; (3; 4) + $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$		1/4, 0, 1/4
[2] $P22_12$ (17, $P222_1$)	1; 3; (2; 4) + $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$	$\mathbf{c}, \mathbf{a}, \mathbf{b}$	0, 1/4, 1/4
[2] $P2_122$ (17, $P222_1$)	1; 4; (2; 3) + $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$	$\mathbf{b}, \mathbf{c}, \mathbf{a}$	1/4, 1/4, 0

• Enlarged unit cell

[3] $\mathbf{a}' = 3\mathbf{a}$			
$\left\{ \begin{array}{l} I2_12_12_1 (24) \\ I2_12_12_1 (24) \\ I2_12_12_1 (24) \end{array} \right.$	$\langle 3; 2 + (1,0,0) \rangle$ $\langle 2 + (3,0,0); 3 + (2,0,0) \rangle$ $\langle 2 + (5,0,0); 3 + (4,0,0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$ $3\mathbf{a}, \mathbf{b}, \mathbf{c}$ $3\mathbf{a}, \mathbf{b}, \mathbf{c}$	1, 0, 0 2, 0, 0
[3] $\mathbf{b}' = 3\mathbf{b}$			
$\left\{ \begin{array}{l} I2_12_12_1 (24) \\ I2_12_12_1 (24) \\ I2_12_12_1 (24) \end{array} \right.$	$\langle 2; 3 + (0,1,0) \rangle$ $\langle 2 + (0,2,0); 3 + (0,1,0) \rangle$ $\langle 2 + (0,4,0); 3 + (0,1,0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	0, 1, 0 0, 2, 0
[3] $\mathbf{c}' = 3\mathbf{c}$			
$\left\{ \begin{array}{l} I2_12_12_1 (24) \\ I2_12_12_1 (24) \\ I2_12_12_1 (24) \end{array} \right.$	$\langle (2; 3) + (0,0,1) \rangle$ $\langle 2 + (0,0,1); 3 + (0,0,3) \rangle$ $\langle 2 + (0,0,1); 3 + (0,0,5) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$ $\mathbf{a}, \mathbf{b}, 3\mathbf{c}$ $\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	0, 0, 1 0, 0, 2

• Series of maximal isomorphic subgroups

[p] $\mathbf{a}' = p\mathbf{a}$			
$I2_12_12_1 (24)$	$\langle 2 + (\frac{p}{2} - \frac{1}{2} + 2u, 0, 0); 3 + (2u, 0, 0) \rangle$ $p > 2; 0 \leq u < p$ p conjugate subgroups for the prime p	$p\mathbf{a}, \mathbf{b}, \mathbf{c}$	$u, 0, 0$
[p] $\mathbf{b}' = p\mathbf{b}$			
$I2_12_12_1 (24)$	$\langle 2 + (0, 2u, 0); 3 + (0, \frac{p}{2} - \frac{1}{2}, 0) \rangle$ $p > 2; 0 \leq u < p$ p conjugate subgroups for the prime p	$\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$0, u, 0$
[p] $\mathbf{c}' = p\mathbf{c}$			
$I2_12_12_1 (24)$	$\langle 2 + (0, 0, \frac{p}{2} - \frac{1}{2}); 3 + (0, 0, \frac{p}{2} - \frac{1}{2} + 2u) \rangle$ $p > 2; 0 \leq u < p$ p conjugate subgroups for the prime p	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	$0, 0, u$

I Minimal translationengleiche supergroups

 [2] $Ibca$ (73); [2] $Imma$ (74); [2] $I4_122$ (98); [2] $I\bar{4}2d$ (122); [3] $I2_13$ (199)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

none

• Decreased unit cell

 [2] $\mathbf{a}' = \frac{1}{2}\mathbf{a}$ $A222$ (21, $C222$); [2] $\mathbf{b}' = \frac{1}{2}\mathbf{b}$ $B222$ (21, $C222$); [2] $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ $C222$ (21)