

$D_2^8$

$I222$

No. 23

$I222$

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  $k$  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] $I112$ (5, $A112$ )	(1; 2)+	<b>b, -a - b, c</b>
[2] $I121$ (5, $C121$ )	(1; 3)+	<b>-a - c, b, a</b>
[2] $I211$ (5, $C121$ )	(1; 4)+	<b>-b - c, a, c</b>

II Maximal klassengleiche subgroups

• Loss of centring translations

[2] $P2_12_12$ (18)	1; 2; (3; 4) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$		0, 0, 1/4
[2] $P2_122_1$ (18, $P2_12_12$ )	1; 3; (2; 4) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$	<b>c, a, b</b>	0, 1/4, 0
[2] $P22_12_1$ (18, $P2_12_12$ )	1; 4; (2; 3) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$	<b>b, c, a</b>	1/4, 0, 0
[2] $P222$ (16)	1; 2; 3; 4		

• Enlarged unit cell

[3] $\mathbf{a}' = 3\mathbf{a}$			
$\left\{ \begin{array}{l} I222 (23) \\ I222 (23) \\ I222 (23) \end{array} \right.$	$\langle 2; 3 \rangle$ $\langle (2; 3) + (2, 0, 0) \rangle$ $\langle (2; 3) + (4, 0, 0) \rangle$	<b>3a, b, c</b> <b>3a, b, c</b> <b>3a, b, c</b>	 1, 0, 0 2, 0, 0
[3] $\mathbf{b}' = 3\mathbf{b}$			
$\left\{ \begin{array}{l} I222 (23) \\ I222 (23) \\ I222 (23) \end{array} \right.$	$\langle 2; 3 \rangle$ $\langle 3; 2 + (0, 2, 0) \rangle$ $\langle 3; 2 + (0, 4, 0) \rangle$	<b>a, 3b, c</b> <b>a, 3b, c</b> <b>a, 3b, c</b>	 0, 1, 0 0, 2, 0
[3] $\mathbf{c}' = 3\mathbf{c}$			
$\left\{ \begin{array}{l} I222 (23) \\ I222 (23) \\ I222 (23) \end{array} \right.$	$\langle 2; 3 \rangle$ $\langle 2; 3 + (0, 0, 2) \rangle$ $\langle 2; 3 + (0, 0, 4) \rangle$	<b>a, b, 3c</b> <b>a, b, 3c</b> <b>a, b, 3c</b>	 0, 0, 1 0, 0, 2

• Series of maximal isomorphic subgroups

[ $p$ ] $\mathbf{a}' = p\mathbf{a}$			
$I222 (23)$	$\langle (2; 3) + (2u, 0, 0) \rangle$ $p > 2; 0 \leq u < p$ $p$ conjugate subgroups for the prime $p$	<b><math>pa, b, c</math></b>	$u, 0, 0$
[ $p$ ] $\mathbf{b}' = p\mathbf{b}$			
$I222 (23)$	$\langle 3; 2 + (0, 2u, 0) \rangle$ $p > 2; 0 \leq u < p$ $p$ conjugate subgroups for the prime $p$	<b><math>a, pb, c</math></b>	$0, u, 0$
[ $p$ ] $\mathbf{c}' = p\mathbf{c}$			
$I222 (23)$	$\langle 2; 3 + (0, 0, 2u) \rangle$ $p > 2; 0 \leq u < p$ $p$ conjugate subgroups for the prime $p$	<b><math>a, b, pc</math></b>	$0, 0, u$

I Minimal translationengleiche supergroups

[2]  $Immm$  (71); [2]  $Ibam$  (72); [2]  $I422$  (97); [2]  $I\bar{4}2m$  (121); [3]  $I23$  (197)

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)