

D_4^9

I422

No. 97

I422

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); (5)

General position

 Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

		(0,0,0)+	$(\frac{1}{2},\frac{1}{2},\frac{1}{2})+$		
16	<i>k</i>	1		(1) x,y,z	(2) \bar{x},\bar{y},z
				(3) \bar{y},x,z	(4) y,\bar{x},z
				(5) \bar{x},y,\bar{z}	(6) x,\bar{y},\bar{z}
				(7) y,x,\bar{z}	(8) \bar{y},\bar{x},\bar{z}

I Maximal translationengleiche subgroups

[2] $I411$ (79, $I4$)	(1; 2; 3; 4)+	
[2] $I221$ (23, $I222$)	(1; 2; 5; 6)+	
[2] $I212$ (22, $F222$)	(1; 2; 7; 8)+	a – b, a + b, c

II Maximal klassengleiche subgroups

• Loss of centring translations

[2] $P4_22_12$ (94)	1; 2; 7; 8; (3; 4; 5; 6) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$	
[2] $P4_222$ (93)	1; 2; 5; 6; (3; 4; 7; 8) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$	0, 1/2, 0
[2] $P42_12$ (90)	1; 2; 3; 4; (5; 6; 7; 8) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$	0, 1/2, 1/4
[2] $P422$ (89)	1; 2; 3; 4; 5; 6; 7; 8	

• Enlarged unit cell

[3] $c' = 3c$		
$\left\{ \begin{array}{l} I422 \text{ (97)} \\ I422 \text{ (97)} \\ I422 \text{ (97)} \end{array} \right.$	$\langle 2; 3; 5 \rangle$ $\langle 2; 3; 5 + (0,0,2) \rangle$ $\langle 2; 3; 5 + (0,0,4) \rangle$	a, b, 3c a, b, 3c a, b, 3c
		0, 0, 1 0, 0, 2

• Series of maximal isomorphic subgroups

[<i>p</i>] $c' = pc$		
$I422$ (97)	$\langle 2; 3; 5 + (0,0,2u) \rangle$ prime $p > 2$; $0 \leq u < p$ p conjugate subgroups	a, b, pc
		0, 0, u
[p^2] $a' = pa, b' = pb$		
$I422$ (97)	$\langle 2 + (2u, 2v, 0); 3 + (u+v, -u+v, 0); 5 + (2u, 0, 0) \rangle$ prime $p > 2$; $0 \leq u < p$; $0 \leq v < p$ p^2 conjugate subgroups	pa, pb, c
		$u, v, 0$

I Minimal translationengleiche supergroups

 [2] $I4/mmm$ (139); [2] $I4/mcm$ (140); [3] $F432$ (209); [3] $I432$ (211)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

none

• Decreased unit cell

 [2] $c' = \frac{1}{2}c$ $C422$ (89, $P422$)