

$P4_2nm$

No. 102

 $P4_2nm$
 C_{4v}^4
Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (3); (5)

General position

 Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

| | | | | | | |
|---|-----|---|---|---|---|---|
| 8 | d | 1 | (1) x, y, z | (2) \bar{x}, \bar{y}, z | (3) $\bar{y} + \frac{1}{2}, x + \frac{1}{2}, z + \frac{1}{2}$ | (4) $y + \frac{1}{2}, \bar{x} + \frac{1}{2}, z + \frac{1}{2}$ |
| | | | (5) $x + \frac{1}{2}, \bar{y} + \frac{1}{2}, z + \frac{1}{2}$ | (6) $\bar{x} + \frac{1}{2}, y + \frac{1}{2}, z + \frac{1}{2}$ | (7) \bar{y}, \bar{x}, z | (8) y, x, z |

I Maximal translationengleiche subgroups

| | | | |
|----------------------------|------------|--|-----------|
| [2] $P4_211$ (77, $P4_2$) | 1; 2; 3; 4 | | |
| [2] $P21m$ (35, $Cmm2$) | 1; 2; 7; 8 | $\mathbf{a} - \mathbf{b}, \mathbf{a} + \mathbf{b}, \mathbf{c}$ | 0, 1/2, 0 |
| [2] $P2n1$ (34, $Pnn2$) | 1; 2; 5; 6 | | |

II Maximal klassengleiche subgroups

• Enlarged unit cell

| | | | |
|---|---|---|-------------|
| [2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}, \mathbf{c}' = 2\mathbf{c}$ | | | |
| $F4_1dc$ (110, $I4_1cd$) | $\langle 2; 3; 5 + (0, 0, 1) \rangle$ | $\mathbf{a} - \mathbf{b}, \mathbf{a} + \mathbf{b}, 2\mathbf{c}$ | |
| $F4_1dc$ (110, $I4_1cd$) | $\langle 2; 5; 3 + (0, 0, 1) \rangle$ | $\mathbf{a} - \mathbf{b}, \mathbf{a} + \mathbf{b}, 2\mathbf{c}$ | 1/2, 1/2, 0 |
| $F4_1dm$ (109, $I4_1md$) | $\langle 2; 3; 5 \rangle$ | $\mathbf{a} - \mathbf{b}, \mathbf{a} + \mathbf{b}, 2\mathbf{c}$ | |
| $F4_1dm$ (109, $I4_1md$) | $\langle 2; (3; 5) + (0, 0, 1) \rangle$ | $\mathbf{a} - \mathbf{b}, \mathbf{a} + \mathbf{b}, 2\mathbf{c}$ | 1/2, 1/2, 0 |
| [3] $\mathbf{c}' = 3\mathbf{c}$ | | | |
| $P4_2nm$ (102) | $\langle 2; (3; 5) + (0, 0, 1) \rangle$ | $\mathbf{a}, \mathbf{b}, 3\mathbf{c}$ | |

• Series of maximal isomorphic subgroups

| | | | |
|--|--|--|-----------|
| [p] $\mathbf{c}' = p\mathbf{c}$ | | | |
| $P4_2nm$ (102) | $\langle 2; (3; 5) + (0, 0, \frac{p}{2} - \frac{1}{2}) \rangle$ prime $p > 2$ no conjugate subgroups | $\mathbf{a}, \mathbf{b}, p\mathbf{c}$ | |
| [p^2] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$ | | | |
| $P4_2nm$ (102) | $\langle 2 + (2u, 2v, 0); 3 + (\frac{p}{2} - \frac{1}{2} + u + v, \frac{p}{2} - \frac{1}{2} - u + v, 0); 5 + (\frac{p}{2} - \frac{1}{2}, \frac{p}{2} - \frac{1}{2} + 2v, 0) \rangle$ prime $p > 2; 0 \leq u < p; 0 \leq v < p$ p^2 conjugate subgroups | $p\mathbf{a}, p\mathbf{b}, \mathbf{c}$ | $u, v, 0$ |

I Minimal translationengleiche supergroups

 [2] $P4_2/nm$ (134); [2] $P4_2/mnm$ (136)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

 [2] $C4_2cm$ (105, $P4_2mc$); [2] $I4mm$ (107)

• Decreased unit cell

 [2] $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ $P4bm$ (100)