

$I4_1cd$

No. 110

 $I4_1cd$
 C_{4v}^{12}
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 b 1

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

I Maximal translationengleiche subgroups

[2] $I4_111$ (80, $I4_1$)	(1; 2; 3; 4)+
[2] $I2c1$ (45, $Iba2$)	(1; 2; 5; 6)+
[2] $I21d$ (43, $Fdd2$)	(1; 2; 7; 8)+

 $\mathbf{a} - \mathbf{b}, \mathbf{a} + \mathbf{b}, \mathbf{c}$
II Maximal klassengleiche subgroups

• Loss of centring translations

none

• Enlarged unit cell

 [3] $\mathbf{c}' = 3\mathbf{c}$
 $I4_1cd$ (110) $\langle 2 + (1,0,1); 3 + (\frac{1}{2}, -\frac{1}{2}, \frac{1}{2}); 5 + (0,0,1) \rangle$
 $\mathbf{a}, \mathbf{b}, 3\mathbf{c}$
 $1/2, 0, 0$

• Series of maximal isomorphic subgroups

 [p] $\mathbf{c}' = p\mathbf{c}$
 $I4_1cd$ (110) $\langle 2 + (0,0, \frac{p}{2} - \frac{1}{2}); 3 + (0,0, \frac{p}{4} - \frac{1}{4}); 5 + (0,0, \frac{p}{2} - \frac{1}{2}) \rangle$
 prime $p > 4$; $p = 4n + 1$
 no conjugate subgroups

 $\mathbf{a}, \mathbf{b}, p\mathbf{c}$
 $I4_1cd$ (110) $\langle 2 + (1,0, \frac{p}{2} - \frac{1}{2}); 3 + (\frac{1}{2}, -\frac{1}{2}, \frac{p}{4} - \frac{1}{4}); 5 + (0,0, \frac{p}{2} - \frac{1}{2}) \rangle$
 prime $p > 2$; $p = 4n - 1$
 no conjugate subgroups

 $\mathbf{a}, \mathbf{b}, p\mathbf{c}$
 $1/2, 0, 0$

 [p²] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$
 $I4_1cd$ (110) $\langle 2 + (\frac{p}{2} - \frac{1}{2} + 2u, \frac{p}{2} - \frac{1}{2} + 2v, 0); 3 + (u + v, \frac{p}{2} - \frac{1}{2} - u + v, 0); 5 + (0, 2v, 0) \rangle$
 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] $I4_1/acd$ (142)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

none

• Decreased unit cell

 [2] $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ $C4_2md$ (102, $P4_2nm$)