

C_3^2
 $P3_1$

No. 144

 $P3_1$
Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2)

General position

 Multiplicity,
 Wyckoff letter,
 Site symmetry

Coordinates

 3 a 1

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

 [3] $P1$ (1) 1

II Maximal klassengleiche subgroups

 • **Enlarged unit cell**

 [2] $c' = 2c$
 $P3_2$ (145) $\langle 2 + (0, 0, 1) \rangle$
 $a, b, 2c$

 [3] $a' = 3a, b' = 3b$
 $H3_1$ (144, $P3_1$) $\langle 2 \rangle$
 $a - b, a + 2b, c$
 $H3_1$ (144, $P3_1$) $\langle 2 + (1, 0, 0) \rangle$
 $a - b, a + 2b, c$
 $2/3, 1/3, 0$
 $H3_1$ (144, $P3_1$) $\langle 2 + (1, 1, 0) \rangle$
 $a - b, a + 2b, c$
 $1/3, 2/3, 0$

 [4] $a' = 2a, b' = 2b$
 $P3_1$ (144) $\langle 2 \rangle$
 $2a, 2b, c$
 $P3_1$ (144) $\langle 2 + (1, -1, 0) \rangle$
 $2a, 2b, c$
 $1, 0, 0$
 $P3_1$ (144) $\langle 2 + (1, 2, 0) \rangle$
 $2a, 2b, c$
 $0, 1, 0$
 $P3_1$ (144) $\langle 2 + (2, 1, 0) \rangle$
 $2a, 2b, c$
 $1, 1, 0$

 • **Series of maximal isomorphic subgroups**

 [p] $c' = pc$
 $P3_2$ (145) $\langle 2 + (0, 0, \frac{2p}{3} - \frac{1}{3}) \rangle$
 a, b, pc
 $p > 1; p \equiv 2 \pmod{3}$

no conjugate subgroups

 $P3_1$ (144) $\langle 2 + (0, 0, \frac{p}{3} - \frac{1}{3}) \rangle$
 a, b, pc
 $p > 6; p \equiv 1 \pmod{3}$

no conjugate subgroups

 [p²] $a' = pa, b' = pb$
 $P3_1$ (144) $\langle 2 + (u + v, -u + 2v, 0) \rangle$
 pa, pb, c
 $u, v, 0$
 $p > 1; p \equiv 2 \pmod{3}; 0 \leq u < p; 0 \leq v < p$
 p^2 conjugate subgroups for prime $p \equiv 2 \pmod{3}$

 [p = q² + r² + qr] $a' = qa - rb, b' = ra + (q + r)b$
 $P3_1$ (144) $\langle 2 + (u, -u, 0) \rangle$
 $qa - rb, ra + (q + r)b, c$
 $u, 0, 0$
 $q > 0; r > 0; p > 6; 0 \leq u < p$
 p conjugate subgroups for each pair of q and r
I Minimal translationengleiche supergroups

 [2] $P3_1 12$ (151); [2] $P3_1 21$ (152); [2] $P6_1$ (169); [2] $P6_4$ (172)

II Minimal non-isomorphic klassengleiche supergroups

 • **Additional centring translations**

 [3] $R_{\text{obv}} 3$ (146, $R3$); [3] $R_{\text{rev}} 3$ (146, $R3$)

 • **Decreased unit cell**

 [3] $c' = \frac{1}{3}c$ $P3$ (143)