

$p4$

No. 10

$p4$

Generators selected (1); $t(1,0)$; $t(0,1)$; (2); (3)

General position

Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

4 d 1

(1) x,y (2) \bar{x},\bar{y} (3) \bar{y},x (4) y,\bar{x}

I Maximal translationengleiche subgroups

[2] $p2$ (2) 1; 2

II Maximal klassengleiche subgroups

• **Enlarged unit cell**

[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$

$c4$ (10, $p4$)

$\langle 2; 3 \rangle$

$\mathbf{a} - \mathbf{b}, \mathbf{a} + \mathbf{b}$

$c4$ (10, $p4$)

$\langle 2 + (1, 1); 3 + (1, 0) \rangle$

$\mathbf{a} - \mathbf{b}, \mathbf{a} + \mathbf{b}$

$1/2, 1/2$

• **Series of maximal isomorphic subgroups**

[p^2] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$

$p4$ (10)

$\langle 2 + (2u, 2v); 3 + (u + v, -u + v) \rangle$

$p\mathbf{a}, p\mathbf{b}$

u, v

prime $p > 2; 0 \leq u < p; 0 \leq v < p$

p^2 conjugate subgroups for $p = 4n - 1$

[$p = q^2 + r^2$] $\mathbf{a}' = q\mathbf{a} - r\mathbf{b}, \mathbf{b}' = r\mathbf{a} + q\mathbf{b}$

$p4$ (10)

$\langle 2 + (2u, 0); 3 + (u, -u) \rangle$

$q\mathbf{a} - r\mathbf{b}, r\mathbf{a} + q\mathbf{b}$

$u, 0$

prime $p = 4n + 1; q > 0; r > 0; 0 \leq u < p$

p conjugate subgroups for each pair of q and r

I Minimal translationengleiche supergroups

[2] $p4mm$ (11); [2] $p4gm$ (12)

II Minimal non-isomorphic klassengleiche supergroups

none