

$I4$ 

No. 79

 $I4$ 
 $C_4^5$ 
**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)

**General position**

 Multiplicity,  
Wyckoff letter,  
Site symmetry

Coordinates

8 c 1

 $(0,0,0)+ (\frac{1}{2},\frac{1}{2},\frac{1}{2})+$ 

 (1)  $x,y,z$  (2)  $\bar{x},\bar{y},z$  (3)  $\bar{y},x,z$  (4)  $y,\bar{x},z$ 
**I Maximal translationengleiche subgroups**

 [2]  $I2$  (5, A112)

 $(1; 2)+$ 
 $\mathbf{b}, -\mathbf{a} - \mathbf{b}, \mathbf{c}$ 
**II Maximal klassengleiche subgroups**

## • Loss of centring translations

 [2]  $P4_2$  (77)

 $1; 2; (3; 4) + (\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$ 
 $1/2, 0, 0$ 

 [2]  $P4$  (75)

 $1; 2; 3; 4$ 

## • Enlarged unit cell

 [3]  $\mathbf{c}' = 3\mathbf{c}$ 
 $I4$  (79)

 $\langle 2; 3 \rangle$ 
 $\mathbf{a}, \mathbf{b}, 3\mathbf{c}$ 

## • Series of maximal isomorphic subgroups

 [p]  $\mathbf{c}' = p\mathbf{c}$ 
 $I4$  (79)

 $\langle 2; 3 \rangle$ 
 $\mathbf{a}, \mathbf{b}, p\mathbf{c}$ 

 prime  $p > 2$ 

no conjugate subgroups

 [ $p^2$ ]  $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$ 
 $I4$  (79)

 $\langle 2 + (2u, 2v, 0); 3 + (u + v, -u + v, 0) \rangle$ 
 $p\mathbf{a}, p\mathbf{b}, \mathbf{c}$ 
 $u, v, 0$ 

 prime  $p > 2; 0 \leq u < p; 0 \leq v < p$ 
 $p^2$  conjugate subgroups for  $p = 4n - 1$ 

 [ $p = q^2 + r^2$ ]  $\mathbf{a}' = q\mathbf{a} - r\mathbf{b}, \mathbf{b}' = r\mathbf{a} + q\mathbf{b}$ 
 $I4$  (79)

 $\langle 2 + (2u, 0, 0); 3 + (u, -u, 0) \rangle$ 
 $q\mathbf{a} - r\mathbf{b}, r\mathbf{a} + q\mathbf{b}, \mathbf{c}$ 
 $u, 0, 0$ 

 prime  $p > 4; q > 0; r > 0; 0 \leq u < p$ 
 $p$  conjugate subgroups for  $p = 4n + 1$ 
**I Minimal translationengleiche supergroups**

 [2]  $I4/m$  (87); [2]  $I422$  (97); [2]  $I4mm$  (107); [2]  $I4cm$  (108)

**II Minimal non-isomorphic klassengleiche supergroups**

## • Additional centring translations

none

## • Decreased unit cell

 [2]  $\mathbf{c}' = \frac{1}{2}\mathbf{c}$   $C4$  (75,  $P4$ )