

C_s^4
 $C1c1$

No. 9

 Cc

 UNIQUE AXIS b , CELL CHOICE 1

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(\frac{1}{2},\frac{1}{2},0)$; (2)

General position

 Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

 4 a 1

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

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

 [2] $C1$ (1, $P1$) $1+$ $1/2(\mathbf{a}-\mathbf{b}), 1/2(\mathbf{a}+\mathbf{b}), \mathbf{c}$
II Maximal klassengleiche subgroups

• Loss of centring translations

[2] $P1c1$ (7)	$1; 2$		
[2] $P1n1$ (7, $P1c1$)	$1; 2+(\frac{1}{2},\frac{1}{2},0)$	$\mathbf{a}, \mathbf{b}, -\mathbf{a}+\mathbf{c}$	$0, 1/4, 0$

• Enlarged unit cell

[3] $\mathbf{b}' = 3\mathbf{b}$			
$\left\{ \begin{array}{l} C1c1 (9) \\ C1c1 (9) \\ C1c1 (9) \end{array} \right.$	$\langle 2 \rangle$ $\langle 2+(0,2,0) \rangle$ $\langle 2+(0,4,0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	 $0, 1, 0$ $0, 2, 0$

[3] $\mathbf{c}' = 3\mathbf{c}$			
$C1c1 (9)$	$\langle 2+(0,0,1) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	
[3] $\mathbf{a}' = \mathbf{a} - 2\mathbf{c}, \mathbf{c}' = 3\mathbf{c}$			
$C1c1 (9)$	$\langle 2+(0,0,1) \rangle$	$\mathbf{a} - 2\mathbf{c}, \mathbf{b}, 3\mathbf{c}$	
[3] $\mathbf{a}' = \mathbf{a} - 4\mathbf{c}, \mathbf{c}' = 3\mathbf{c}$			
$C1c1 (9)$	$\langle 2+(0,0,1) \rangle$	$\mathbf{a} - 4\mathbf{c}, \mathbf{b}, 3\mathbf{c}$	
[3] $\mathbf{a}' = 3\mathbf{a}$			
$C1c1 (9)$	$\langle 2 \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$	

• Series of maximal isomorphic subgroups

[p] $\mathbf{b}' = p\mathbf{b}$			
$C1c1 (9)$	$\langle 2+(0,2u,0) \rangle$ prime $p > 2; 0 \leq u < p$ p conjugate subgroups	$\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$0, u, 0$
[p] $\mathbf{a}' = \mathbf{a} - 2q\mathbf{c}, \mathbf{c}' = p\mathbf{c}$			
$C1c1 (9)$	$\langle 2+(0,0,\frac{p}{2}-\frac{1}{2}) \rangle$ prime $p > 2; 0 \leq q < p$ no conjugate subgroups	$\mathbf{a} - 2q\mathbf{c}, \mathbf{b}, p\mathbf{c}$	
[p] $\mathbf{a}' = p\mathbf{a}$			
$C1c1 (9)$	$\langle 2 \rangle$ prime $p > 2$ no conjugate subgroups	$p\mathbf{a}, \mathbf{b}, \mathbf{c}$	

I Minimal translationengleiche supergroups

 [2] $C12/c1$ (15); [2] $Cmc2_1$ (36); [2] $Ccc2$ (37); [2] $Ama2$ (40); [2] $Aea2$ (41); [2] $Fdd2$ (43); [2] $Iba2$ (45); [2] $Ima2$ (46);
 [3] $P3c1$ (158); [3] $P31c$ (159); [3] $R3c$ (161)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

 [2] $F1m1$ (8, $C1m1$)

• Decreased unit cell

 [2] $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ $C1m1$ (8); [2] $\mathbf{a}' = \frac{1}{2}\mathbf{a}, \mathbf{b}' = \frac{1}{2}\mathbf{b}$ $P1c1$ (7)

UNIQUE AXIS *c*, CELL CHOICE 1**Generators selected** (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(0, \frac{1}{2}, \frac{1}{2})$; (2)**General position**Multiplicity,
Wyckoff letter,
Site symmetry**Coordinates** $(0,0,0)+$ $(0, \frac{1}{2}, \frac{1}{2})+$ 4 *a* 1(1) x,y,z (2) $x + \frac{1}{2}, y, \bar{z}$ **I Maximal translationengleiche subgroups**[2] A1 (1, P1) 1+ **a, 1/2(b - c), 1/2(b + c)****II Maximal klassengleiche subgroups**• **Loss of centring translations**

[2] P11a (7) 1; 2

[2] P11n (7, P11a) 1; $2 + (0, \frac{1}{2}, \frac{1}{2})$ **a - b, b, c**

0, 0, 1/4

• **Enlarged unit cell**[3] $c' = 3c$

{	A11a (9)	$\langle 2 \rangle$	a, b, 3c	
	A11a (9)	$\langle 2 + (0, 0, 2) \rangle$	a, b, 3c	0, 0, 1
	A11a (9)	$\langle 2 + (0, 0, 4) \rangle$	a, b, 3c	0, 0, 2

[3] $a' = 3a$ A11a (9) $\langle 2 + (1, 0, 0) \rangle$ **3a, b, c**[3] $a' = 3a, b' = -2a + b$ A11a (9) $\langle 2 + (1, 0, 0) \rangle$ **3a, -2a + b, c**[3] $a' = 3a, b' = -4a + b$ A11a (9) $\langle 2 + (1, 0, 0) \rangle$ **3a, -4a + b, c**[3] $b' = 3b$ A11a (9) $\langle 2 \rangle$ **a, 3b, c**• **Series of maximal isomorphic subgroups**[*p*] $c' = pc$ A11a (9) $\langle 2 + (0, 0, 2u) \rangle$
prime $p > 2$; $0 \leq u < p$
p conjugate subgroups**a, b, pc**0, 0, *u*[*p*] $a' = pa, b' = -2qa + b$ A11a (9) $\langle 2 + (\frac{p}{2} - \frac{1}{2}, 0, 0) \rangle$
prime $p > 2$; $0 \leq q < p$
no conjugate subgroups**pa, -2qa + b, c**[*p*] $b' = pb$ A11a (9) $\langle 2 \rangle$
prime $p > 2$
no conjugate subgroups**a, pb, c****I Minimal translationengleiche supergroups**[2] A112/*a* (15); [2] Cmc₂ (36); [2] Ccc₂ (37); [2] Ama₂ (40); [2] Aea₂ (41); [2] Fdd₂ (43); [2] Iba₂ (45); [2] Ima₂ (46);[3] P3c₁ (158); [3] P31c (159); [3] R3c (161)**II Minimal non-isomorphic klassengleiche supergroups**• **Additional centring translations**

[2] F11m (8, A11m)

• **Decreased unit cell**[2] $a' = \frac{1}{2}a$ A11m (8); [2] $b' = \frac{1}{2}b, c' = \frac{1}{2}c$ P11a (7)