

$I4cm$ 

No. 108

 $I4cm$ 
 $C_{4v}^{10}$ 
**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**

16	$d$	1	(1) $x, y, z$	(2) $\bar{x}, \bar{y}, z$	(3) $\bar{y}, x, z$	(4) $y, \bar{x}, z$
			(5) $x, \bar{y}, z + \frac{1}{2}$	(6) $\bar{x}, y, z + \frac{1}{2}$	(7) $\bar{y}, \bar{x}, z + \frac{1}{2}$	(8) $y, x, z + \frac{1}{2}$

**I Maximal translationengleiche subgroups**

[2] $I411$ (79, $I4$ )	(1; 2; 3; 4)+		
[2] $I2c1$ (45, $Iba2$ )	(1; 2; 5; 6)+		
[2] $I21m$ (42, $Fmm2$ )	(1; 2; 7; 8)+	$\mathbf{a} - \mathbf{b}, \mathbf{a} + \mathbf{b}, \mathbf{c}$	$0, 1/2, 0$

**II Maximal klassengleiche subgroups**

## • Loss of centring translations

[2] $P4_2bc$ (106)	1; 2; 7; 8; (3; 4; 5; 6) + $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$		$0, 1/2, 0$
[2] $P4cc$ (103)	1; 2; 3; 4; 5; 6; 7; 8		
[2] $P4_2cm$ (101)	1; 2; 5; 6; (3; 4; 7; 8) + $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$		$0, 1/2, 0$
[2] $P4bm$ (100)	1; 2; 3; 4; (5; 6; 7; 8) + $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$		

## • Enlarged unit cell

[3] $\mathbf{c}' = 3\mathbf{c}$			
$I4cm$ (108)	$\langle 2; 3; 5 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	

## • Series of maximal isomorphic subgroups

[ $p$ ] $\mathbf{c}' = p\mathbf{c}$			
$I4cm$ (108)	$\langle 2; 3; 5 + (0, 0, \frac{p}{2} - \frac{1}{2}) \rangle$	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	
	$p > 2$		
	no conjugate subgroups		
[ $p^2$ ] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$			
$I4cm$ (108)	$\langle 2 + (2u, 2v, 0); 3 + (u + v, -u + v, 0); 5 + (0, 2v, 0) \rangle$	$p\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$u, v, 0$
	$p > 2; 0 \leq u < p; 0 \leq v < p$		
	$p^2$ conjugate subgroups for the prime $p$		

**I Minimal translationengleiche supergroups**

 [2]  $I4/mcm$  (140)

**II Minimal non-isomorphic klassengleiche supergroups**

## • Additional centring translations

none

## • Decreased unit cell

 [2]  $\mathbf{c}' = \frac{1}{2}\mathbf{c}$   $C4mm$  (99,  $P4mm$ )