

$C_{4v}^7$ 
 $P4_2mc$ 

No. 105

 $P4_2mc$ 
**Generators selected** (1);  $t(1,0,0)$ ;  $t(0,1,0)$ ;  $t(0,0,1)$ ; (2); (3); (5)

**General position**

 Multiplicity,  
Wyckoff letter,  
Site symmetry

Coordinates

8	<i>f</i>	1		(1) $x, y, z$	(2) $\bar{x}, \bar{y}, z$	(3) $\bar{y}, x, z + \frac{1}{2}$	(4) $y, \bar{x}, z + \frac{1}{2}$
				(5) $x, \bar{y}, z$	(6) $\bar{x}, y, z$	(7) $\bar{y}, \bar{x}, z + \frac{1}{2}$	(8) $y, x, z + \frac{1}{2}$

**I Maximal translationengleiche subgroups**

[2] $P4_211$ (77, $P4_2$ )	1; 2; 3; 4	
[2] $P21c$ (37, $Ccc2$ )	1; 2; 7; 8	<b>a – b, a + b, c</b>
[2] $P2m1$ (25, $Pmm2$ )	1; 2; 5; 6	

**II Maximal klassengleiche subgroups**

## • Enlarged unit cell

[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$		
$C4_2md$ (102, $P4_2nm$ )	$\langle 2; 3; 5 + (0, 1, 0) \rangle$	<b>a – b, a + b, c</b> 1/2, 1/2, 0
$C4_2md$ (102, $P4_2nm$ )	$\langle 2; 5; 3 + (1, 0, 0) \rangle$	<b>a – b, a + b, c</b>
$C4_2mc$ (101, $P4_2cm$ )	$\langle 2; 3; 5 \rangle$	<b>a – b, a + b, c</b>
$C4_2mc$ (101, $P4_2cm$ )	$\langle 2; 3 + (1, 0, 0); 5 + (0, 1, 0) \rangle$	<b>a – b, a + b, c</b> 1/2, 1/2, 0
[3] $\mathbf{c}' = 3\mathbf{c}$		
$P4_2mc$ (105)	$\langle 2; 5; 3 + (0, 0, 1) \rangle$	<b>a, b, 3c</b>

## • Series of maximal isomorphic subgroups

[ <i>p</i> ] $\mathbf{c}' = p\mathbf{c}$		
$P4_2mc$ (105)	$\langle 2; 5; 3 + (0, 0, \frac{p}{2} - \frac{1}{2}) \rangle$	<b>a, b, pc</b>
	prime $p > 2$	
	no conjugate subgroups	
[ $p^2$ ] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$		
$P4_2mc$ (105)	$\langle 2 + (2u, 2v, 0); 3 + (u + v, -u + v, 0); 5 + (0, 2v, 0) \rangle$	<b>pa, pb, c</b> $u, v, 0$
	prime $p > 2; 0 \leq u < p; 0 \leq v < p$	
	$p^2$ conjugate subgroups	

**I Minimal translationengleiche supergroups**

 [2]  $P4_2/mmc$  (131); [2]  $P4_2/nmc$  (137)

**II Minimal non-isomorphic klassengleiche supergroups**

## • Additional centring translations

 [2]  $C4_2mc$  (101,  $P4_2cm$ ); [2]  $I4mm$  (107)

## • Decreased unit cell

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