

$P4_2/mbc$ 

No. 135

 $P4_2/m2_1/b2/c$ 
 $D_{4h}^{13}$ 
**Generators selected** (1);  $t(1,0,0)$ ;  $t(0,1,0)$ ;  $t(0,0,1)$ ; (2); (3); (5); (9)

**General position**

 Multiplicity,  
Wyckoff letter,  
Site symmetry

**Coordinates**

16	<i>i</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) $\bar{x} + \frac{1}{2}, y + \frac{1}{2}, \bar{z}$	(6) $x + \frac{1}{2}, \bar{y} + \frac{1}{2}, \bar{z}$	(7) $y + \frac{1}{2}, x + \frac{1}{2}, \bar{z} + \frac{1}{2}$	(8) $\bar{y} + \frac{1}{2}, \bar{x} + \frac{1}{2}, \bar{z} + \frac{1}{2}$
			(9) $\bar{x}, \bar{y}, \bar{z}$	(10) $x, y, \bar{z}$	(11) $y, \bar{x}, \bar{z} + \frac{1}{2}$	(12) $\bar{y}, x, \bar{z} + \frac{1}{2}$
			(13) $x + \frac{1}{2}, \bar{y} + \frac{1}{2}, z$	(14) $\bar{x} + \frac{1}{2}, y + \frac{1}{2}, z$	(15) $\bar{y} + \frac{1}{2}, \bar{x} + \frac{1}{2}, z + \frac{1}{2}$	(16) $y + \frac{1}{2}, x + \frac{1}{2}, z + \frac{1}{2}$

**I Maximal translationengleiche subgroups**

[2] $P\bar{4}b2$ (117)	1; 2; 7; 8; 11; 12; 13; 14		0, 0, 1/4
[2] $P4_2c$ (114)	1; 2; 5; 6; 11; 12; 15; 16		0, 0, 1/4
[2] $P4_2bc$ (106)	1; 2; 3; 4; 13; 14; 15; 16		
[2] $P4_22_12$ (94)	1; 2; 3; 4; 5; 6; 7; 8		0, 1/2, 1/4
[2] $P4_2/m11$ (84, $P4_2/m$ )	1; 2; 3; 4; 9; 10; 11; 12		
[2] $P2/m12/c$ (66, $Cccm$ )	1; 2; 7; 8; 9; 10; 15; 16	<b>a - b, a + b, c</b>	0, 1/2, 0
[2] $P2/m2_1/b1$ (55, $Pbam$ )	1; 2; 5; 6; 9; 10; 13; 14		

**II Maximal klassengleiche subgroups**

## • Enlarged unit cell

[3] $\mathbf{c}' = 3\mathbf{c}$			
$P4_2/mbc$ (135)	$\langle 2; 5; 9; 3 + (0, 0, 1) \rangle$	<b>a, b, 3c</b>	
$P4_2/mbc$ (135)	$\langle 2; 3 + (0, 0, 1); (5; 9) + (0, 0, 2) \rangle$	<b>a, b, 3c</b>	0, 0, 1
$P4_2/mbc$ (135)	$\langle 2; 3 + (0, 0, 1); (5; 9) + (0, 0, 4) \rangle$	<b>a, b, 3c</b>	0, 0, 2

## • Series of maximal isomorphic subgroups

[ <i>p</i> ] $\mathbf{c}' = p\mathbf{c}$			
$P4_2/mbc$ (135)	$\langle 2; 3 + (0, 0, \frac{p}{2} - \frac{1}{2}); (5; 9) + (0, 0, 2u) \rangle$ prime $p > 2$ ; $0 \leq u < p$ $p$ conjugate subgroups	<b>a, b, pc</b>	0, 0, $u$
[ $p^2$ ] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$			
$P4_2/mbc$ (135)	$\langle (2; 9) + (2u, 2v, 0); 3 + (u + v, -u + v, 0); 5 + (\frac{p}{2} - \frac{1}{2} + 2u, \frac{p}{2} - \frac{1}{2}, 0) \rangle$ prime $p > 2$ ; $0 \leq u < p$ ; $0 \leq v < p$ $p^2$ conjugate subgroups	<b>pa, pb, c</b>	$u, v, 0$

**I Minimal translationengleiche supergroups**

none

**II Minimal non-isomorphic klassengleiche supergroups**

## • Additional centring translations

 [2]  $C4_2/mmc$  (132,  $P4_2/mcm$ ); [2]  $I4/mcm$  (140)

## • Decreased unit cell

 [2]  $\mathbf{c}' = \frac{1}{2}\mathbf{c}$   $P4/mbm$  (127)