

D_{3d}^3
 $P\bar{3}2/m1$

No. 164

 $P\bar{3}m1$
Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (4); (7)

General position

 Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

12	j	1	(1) x, y, z	(2) $\bar{y}, x - y, z$	(3) $\bar{x} + y, \bar{x}, z$
			(4) y, x, \bar{z}	(5) $x - y, \bar{y}, \bar{z}$	(6) $\bar{x}, \bar{x} + y, \bar{z}$
			(7) $\bar{x}, \bar{y}, \bar{z}$	(8) $y, \bar{x} + y, \bar{z}$	(9) $x - y, x, \bar{z}$
			(10) \bar{y}, \bar{x}, z	(11) $\bar{x} + y, y, z$	(12) $x, x - y, z$

I Maximal translationengleiche subgroups

[2] $P3m1$ (156)	1; 2; 3; 10; 11; 12	
[2] $P321$ (150)	1; 2; 3; 4; 5; 6	
[2] $P\bar{3}11$ (147, $P\bar{3}$)	1; 2; 3; 7; 8; 9	
{ [3] $P12/m1$ (12, $C12/m1$)	1; 4; 7; 10	$-\mathbf{a} + \mathbf{b}, -\mathbf{a} - \mathbf{b}, \mathbf{c}$
{ [3] $P12/m1$ (12, $C12/m1$)	1; 5; 7; 11	$-\mathbf{a} - 2\mathbf{b}, \mathbf{a}, \mathbf{c}$
{ [3] $P12/m1$ (12, $C12/m1$)	1; 6; 7; 12	$2\mathbf{a} + \mathbf{b}, \mathbf{b}, \mathbf{c}$

II Maximal klassengleiche subgroups

• Enlarged unit cell

[2] $\mathbf{c}' = 2\mathbf{c}$			
$P\bar{3}c1$ (165)	$\langle 2; 7; 4 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
$P\bar{3}c1$ (165)	$\langle 2; 4; 7 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	$0, 0, 1/2$
$P\bar{3}m1$ (164)	$\langle 2; 4; 7 \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
$P\bar{3}m1$ (164)	$\langle 2; (4; 7) + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	$0, 0, 1/2$
[3] $\mathbf{c}' = 3\mathbf{c}$			
{ $P\bar{3}m1$ (164)	$\langle 2; 4; 7 \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	
{ $P\bar{3}m1$ (164)	$\langle 2; (4; 7) + (0, 0, 2) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	$0, 0, 1$
{ $P\bar{3}m1$ (164)	$\langle 2; (4; 7) + (0, 0, 4) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	$0, 0, 2$
[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$			
{ $H\bar{3}m1$ (162, $P\bar{3}1m$)	$\langle 2; 4; 7 \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	
{ $H\bar{3}m1$ (162, $P\bar{3}1m$)	$\langle (2; 4) + (1, -1, 0); 7 + (2, 0, 0) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	$1, 0, 0$
{ $H\bar{3}m1$ (162, $P\bar{3}1m$)	$\langle 4; 2 + (2, 1, 0); 7 + (2, 2, 0) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	$1, 1, 0$
[4] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$			
{ $P\bar{3}m1$ (164)	$\langle 2; 4; 7 \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	
{ $P\bar{3}m1$ (164)	$\langle (2; 4) + (1, -1, 0); 7 + (2, 0, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	$1, 0, 0$
{ $P\bar{3}m1$ (164)	$\langle 2 + (1, 2, 0); 4 + (-1, 1, 0); 7 + (0, 2, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	$0, 1, 0$
{ $P\bar{3}m1$ (164)	$\langle 4; 2 + (2, 1, 0); 7 + (2, 2, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	$1, 1, 0$

• Series of maximal isomorphic subgroups

[p] $\mathbf{c}' = p\mathbf{c}$			
$P\bar{3}m1$ (164)	$\langle 2; (4; 7) + (0, 0, 2u) \rangle$	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	$0, 0, u$
	$p > 2; 0 \leq u < p$		
	p conjugate subgroups for the prime p		
[p^2] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$			
$P\bar{3}m1$ (164)	$\langle 2 + (u + v, -u + 2v, 0); 4 + (u - v, -u + v, 0); 7 + (2u, 2v, 0) \rangle$	$p\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$u, v, 0$
	$p > 1; p \neq 3; 0 \leq u < p; 0 \leq v < p$		
	p^2 conjugate subgroups for the prime p		

I Minimal translationengleiche supergroups

 [2] $P6/mmm$ (191); [2] $P6_3/mmc$ (194)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

 [3] $H\bar{3}m1$ (162, $P\bar{3}1m$); [3] $R_{\text{obv}}\bar{3}m$ (166, $R\bar{3}m$); [3] $R_{\text{rev}}\bar{3}m$ (166, $R\bar{3}m$)

• Decreased unit cell

none