

$P3c1$

No. 158

 $P3c1$
 C_{3v}^3
Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (4)

General position

 Multiplicity,
 Wyckoff letter,
 Site symmetry

Coordinates

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

I Maximal translationengleiche subgroups

[2] $P311$ (143, $P3$)	1; 2; 3	
{ [3] $P1c1$ (9, $C1c1$)	1; 4	$-\mathbf{a} + \mathbf{b}, -\mathbf{a} - \mathbf{b}, \mathbf{c}$
[3] $P1c1$ (9, $C1c1$)	1; 5	$-\mathbf{a} - 2\mathbf{b}, \mathbf{a}, \mathbf{c}$
{ [3] $P1c1$ (9, $C1c1$)	1; 6	$2\mathbf{a} + \mathbf{b}, \mathbf{b}, \mathbf{c}$

II Maximal klassengleiche subgroups

• Enlarged unit cell

[3] $\mathbf{c}' = 3\mathbf{c}$			
$P3c1$ (158)	$\langle 2; 4 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	
[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$			
{ $H3c1$ (159, $P31c$)	$\langle 2; 4 \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	
{ $H3c1$ (159, $P31c$)	$\langle 2 + (1, -1, 0); 4 + (1, 1, 0) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	1, 0, 0
{ $H3c1$ (159, $P31c$)	$\langle 2 + (2, 1, 0); 4 + (2, 2, 0) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	1, 1, 0
{ $H3c1$ (159, $P31c$)	$\langle 4; 2 + (1, 0, 0) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	$2/3, -2/3, 0$
{ $H3c1$ (159, $P31c$)	$\langle 2 + (2, 2, 0); 4 + (1, 1, 0) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	$2/3, 1/3, 0$
{ $H3c1$ (159, $P31c$)	$\langle 2 + (3, 4, 0); 4 + (2, 2, 0) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	$2/3, 4/3, 0$
{ $H3c1$ (159, $P31c$)	$\langle 4; 2 + (1, 1, 0) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	$1/3, -1/3, 0$
{ $H3c1$ (159, $P31c$)	$\langle 2 + (2, 3, 0); 4 + (1, 1, 0) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	$1/3, 2/3, 0$
{ $H3c1$ (159, $P31c$)	$\langle 2 + (3, 2, 0); 4 + (2, 2, 0) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	$4/3, 2/3, 0$
[4] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$			
{ $P3c1$ (158)	$\langle 2; 4 \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	
{ $P3c1$ (158)	$\langle 2 + (1, -1, 0); 4 + (1, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	1, 0, 0
{ $P3c1$ (158)	$\langle 2 + (1, 2, 0); 4 + (1, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	0, 1, 0
{ $P3c1$ (158)	$\langle 2 + (2, 1, 0); 4 + (2, 2, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	1, 1, 0

• Series of maximal isomorphic subgroups

[p] $\mathbf{c}' = p\mathbf{c}$			
$P3c1$ (158)	$\langle 2; 4 + (0, 0, \frac{p}{2} - \frac{1}{2}) \rangle$	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	
	$p > 2$		
	no conjugate subgroups		
[p^2] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$			
$P3c1$ (158)	$\langle 2 + (u + v, -u + 2v, 0); 4 + (u + v, u + v, 0) \rangle$	$p\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$u, v, 0$
	$p > 1; p \neq 3; 0 \leq u < p; 0 \leq v < p$		
	p^2 conjugate subgroups for the prime p		

I Minimal translationengleiche supergroups

 [2] $P\bar{3}c1$ (165); [2] $P6cc$ (184); [2] $P6_3cm$ (185); [2] $P\bar{6}c2$ (188)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

 [3] $H3c1$ (159, $P31c$); [3] $R_{\text{obv}}3c$ (161, $R3c$); [3] $R_{\text{rev}}3c$ (161, $R3c$)

• Decreased unit cell

 [2] $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ $P3m1$ (156)