

C_{3v}^2
 $P31m$

No. 157

 $P31m$
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) y, x, z (5) $x-y, \bar{y}, z$ (6) $\bar{x}, \bar{x}+y, z$
I Maximal translationengleiche subgroups

[2] $P311$ (143, $P3$)	1; 2; 3	
{ [3] $P11m$ (8, $C1m1$)	1; 4	$-\mathbf{a}-\mathbf{b}, \mathbf{a}-\mathbf{b}, \mathbf{c}$
	1; 5	$\mathbf{a}, \mathbf{a}+2\mathbf{b}, \mathbf{c}$
	1; 6	$\mathbf{b}, -2\mathbf{a}-\mathbf{b}, \mathbf{c}$

II Maximal klassengleiche subgroups

• Enlarged unit cell

[2] $\mathbf{c}' = 2\mathbf{c}$			
$P31c$ (159)	$\langle 2; 4 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
$P31m$ (157)	$\langle 2; 4 \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
[3] $\mathbf{c}' = 3\mathbf{c}$			
$P31m$ (157)	$\langle 2; 4 \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	
[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$			
$H31m$ (156, $P3m1$)	$\langle 2; 4 \rangle$	$\mathbf{a}-\mathbf{b}, \mathbf{a}+2\mathbf{b}, \mathbf{c}$	
[3] $\mathbf{a}' = \mathbf{a}-\mathbf{b}, \mathbf{b}' = \mathbf{a}+2\mathbf{b}, \mathbf{c}' = 3\mathbf{c}$			
$R3m$ (160)	$\langle 2; 4 \rangle$	$\mathbf{a}-\mathbf{b}, \mathbf{a}+2\mathbf{b}, 3\mathbf{c}$	
[3] $\mathbf{a}' = 2\mathbf{a}+\mathbf{b}, \mathbf{b}' = -\mathbf{a}+\mathbf{b}, \mathbf{c}' = 3\mathbf{c}$			
$R3m$ (160)	$\langle 2; 4 \rangle$	$2\mathbf{a}+\mathbf{b}, -\mathbf{a}+\mathbf{b}, 3\mathbf{c}$	
[4] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$			
{ $P31m$ (157)	$\langle 2; 4 \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	
	$\langle (2; 4) + (1, -1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	1, 0, 0
	$\langle 2 + (1, 2, 0); 4 + (-1, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	0, 1, 0
	$\langle 4; 2 + (2, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	1, 1, 0

• Series of maximal isomorphic subgroups

[p] $\mathbf{c}' = p\mathbf{c}$			
$P31m$ (157)	$\langle 2; 4 \rangle$	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	
	p prime		
	no conjugate subgroups		
[p^2] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$			
$P31m$ (157)	$\langle 2 + (u+v, -u+2v, 0); 4 + (u-v, -u+v, 0) \rangle$	$p\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$u, v, 0$
	prime $p \neq 3$; $0 \leq u < p$; $0 \leq v < p$		
	p^2 conjugate subgroups		

I Minimal translationengleiche supergroups

 [2] $P\bar{3}1m$ (162); [2] $P6mm$ (183); [2] $P6_3cm$ (185); [2] $P\bar{6}2m$ (189)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

 [3] $H31m$ (156, $P3m1$)

• Decreased unit cell

none