$P3m1$ No. 156 $P3m1$ C_{3v}^1

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

I Maximal *translationengleiche* subgroups

[2] $P311$ (143, $P3$)	1; 2; 3		
[3] $P1m1$ (8, $C1m1$)	1; 4	$-\mathbf{a}+\mathbf{b},-\mathbf{a}-\mathbf{b},\mathbf{c}$	
[3] $P1m1$ (8, $C1m1$)	1; 5	$-\mathbf{a}-2\mathbf{b},\mathbf{a},\mathbf{c}$	
[3] $P1m1$ (8, $C1m1$)	1; 6	$2\mathbf{a}+\mathbf{b},\mathbf{b},\mathbf{c}$	

II Maximal *klassengleiche* subgroups

- **Enlarged unit cell**

[2] $\mathbf{c}'=2\mathbf{c}$			
$P3c1$ (158)	$\langle 2;\ 4+(0,0,1)\rangle$	$\mathbf{a},\mathbf{b},2\mathbf{c}$	
$P3m1$ (156)	$\langle 2;\ 4\rangle$	$\mathbf{a},\mathbf{b},2\mathbf{c}$	
[3] $\mathbf{c}'=3\mathbf{c}$			
$P3m1$ (156)	$\langle 2;\ 4\rangle$	$\mathbf{a},\mathbf{b},3\mathbf{c}$	
[3] $\mathbf{a}'=3\mathbf{a},\ \mathbf{b}'=3\mathbf{b}$			
$H3m1$ (157, $P31m$)	$\langle 2;\ 4\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	
$H3m1$ (157, $P31m$)	$\langle 2+(1,-1,0);\ 4+(1,1,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$1,0,0$
$H3m1$ (157, $P31m$)	$\langle 2+(2,1,0);\ 4+(2,2,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$1,1,0$
$H3m1$ (157, $P31m$)	$\langle 4;\ 2+(1,0,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$2/3,-2/3,0$
$H3m1$ (157, $P31m$)	$\langle 2+(2,2,0);\ 4+(1,1,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$2/3,1/3,0$
$H3m1$ (157, $P31m$)	$\langle 2+(3,4,0);\ 4+(2,2,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$2/3,4/3,0$
$H3m1$ (157, $P31m$)	$\langle 4;\ 2+(1,1,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$1/3,-1/3,0$
$H3m1$ (157, $P31m$)	$\langle 2+(2,3,0);\ 4+(1,1,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$1/3,2/3,0$
$H3m1$ (157, $P31m$)	$\langle 2+(3,2,0);\ 4+(2,2,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$4/3,2/3,0$
[4] $\mathbf{a}'=2\mathbf{a},\ \mathbf{b}'=2\mathbf{b}$			
$P3m1$ (156)	$\langle 2;\ 4\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	
$P3m1$ (156)	$\langle 2+(1,-1,0);\ 4+(1,1,0)\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	$1,0,0$
$P3m1$ (156)	$\langle 2+(1,2,0);\ 4+(1,1,0)\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	$0,1,0$
$P3m1$ (156)	$\langle 2+(2,1,0);\ 4+(2,2,0)\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	$1,1,0$

- **Series of maximal isomorphic subgroups**

[p] $\mathbf{c}'=p\mathbf{c}$			
$P3m1$ (156)	$\langle 2;\ 4\rangle$ p prime no conjugate subgroups	$\mathbf{a},\mathbf{b},p\mathbf{c}$	
[p^2] $\mathbf{a}'=p\mathbf{a},\ \mathbf{b}'=p\mathbf{b}$			
$P3m1$ (156)	$\langle 2+(u+v,-u+2v,0);\ 4+(u+v,u+v,0)\rangle$ prime $p\neq 3$; $0\leq u<p$; $0\leq v<p$ p^2 conjugate subgroups	$p\mathbf{a},p\mathbf{b},\mathbf{c}$	$u,v,0$

I Minimal *translationengleiche* supergroups

[2] $P\bar{3}m1$ (164); [2] $P6mm$ (183); [2] $P6_3mc$ (186); [2] $P\bar{6}m2$ (187)

II Minimal non-isomorphic *klassengleiche* supergroups

- **Additional centring translations**

[3] $H3m1$ (157, $P31m$); [3] $R_{\rm obv}3m$ (160, $R3m$); [3] $R_{\rm rev}3m$ (160, $R3m$)

- **Decreased unit cell** none

