C_{6v}^{2} $P6cc$ No. 184 $P6cc$

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

I Maximal *translationengleiche* subgroups

[2] $P611$ (168, $P6$)	1; 2; 3; 4; 5; 6	
[2] $P31c$ (159)	1; 2; 3; 10; 11; 12	
[2] $P3c1$ (158)	1; 2; 3; 7; 8; 9	
[3] $P2cc$ (37, $Ccc2$)	1; 4; 7; 10	$-\mathbf{a}+\mathbf{b},-\mathbf{a}-\mathbf{b},\mathbf{c}$
[3] $P2cc$ (37, $Ccc2$)	1; 4; 8; 11	$-\mathbf{a}-2\mathbf{b},\mathbf{a},\mathbf{c}$
[3] $P2cc$ (37, $Ccc2$)	1; 4; 9; 12	$2\mathbf{a}+\mathbf{b},\mathbf{b},\mathbf{c}$

II Maximal *klassengleiche* subgroups

- **Enlarged unit cell**

[3] $\mathbf{c}'=3\mathbf{c}$			
$P6cc$ (184)	$\langle 2;\ 4;\ 7+(0,0,1)\rangle$	$\mathbf{a},\mathbf{b},3\mathbf{c}$	
[3] $\mathbf{a}'=3\mathbf{a},\ \mathbf{b}'=3\mathbf{b}$			
$H6cc$ (184, $P6cc$)	$\langle 2;\ 4;\ 7\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	
$H6cc$ (184, $P6cc$)	$\langle 2+(1,-1,0);\ 4+(2,0,0);\ 7+(1,1,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$1,0,0$
$H6cc$ (184, $P6cc$)	$\langle 2+(2,-2,0);\ 4+(4,0,0);\ 7+(2,2,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$2,0,0$
[4] $\mathbf{a}'=2\mathbf{a},\ \mathbf{b}'=2\mathbf{b}$			
$P6cc$ (184)	$\langle 2;\ 4;\ 7\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	
$P6cc$ (184)	$\langle 2+(1,-1,0);\ 4+(2,0,0);\ 7+(1,1,0)\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	$1,0,0$
$P6cc$ (184)	$\langle 2+(1,2,0);\ 4+(0,2,0);\ 7+(1,1,0)\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	$0,1,0$
$P6cc$ (184)	$\langle 2+(2,1,0);\ (4;\ 7)+(2,2,0)\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	$1,1,0$

- **Series of maximal isomorphic subgroups**

[p] $\mathbf{c}'=p\mathbf{c}$			
$P6cc$ (184)	$\langle 2;\ 4;\ 7+(0,0,\frac{p}{2}-\frac{1}{2})\rangle$ $p>2$ no conjugate subgroups	$\mathbf{a},\mathbf{b},p\mathbf{c}$	
[p^2] $\mathbf{a}'=p\mathbf{a},\ \mathbf{b}'=p\mathbf{b}$			
$P6cc$ (184)	$\langle 2+(u+v,-u+2v,0);\ 4+(2u,2v,0);$ $7+(u+v,u+v,0)\rangle$ $p>1;\ p\neq 3;\ 0\leq u<p;\ 0\leq v<p$ p^2 conjugate subgroups for the prime p	$p\mathbf{a},p\mathbf{b},\mathbf{c}$	$u,v,0$

I Minimal *translationengleiche* supergroups

[2] $P6/mcc$ (192)

II Minimal non-isomorphic *klassengleiche* supergroups

- **Additional centring translations** none

- **Decreased unit cell**

[2] $\mathbf{c}'=\frac{1}{2}\mathbf{c}$ $P6mm$ (183)