C_{3i}^1 $P\bar{3}$ No. 147 $P\bar{3}$

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

I Maximal *translationengleiche* subgroups

[2] $P3$ (143) 1; 2; 3
[3] $P\bar{1}$ (2) 1; 4

II Maximal *klassengleiche* subgroups

- **Enlarged unit cell**

[2] $\mathbf{c}' = 2\mathbf{c}$

$P\bar{3}$ (147)	$\langle 2;\ 4\rangle$	$\mathbf{a},\mathbf{b},2\mathbf{c}$	
$P\bar{3}$ (147)	$\langle 2;\ 4+(0,0,1)\rangle$	$\mathbf{a},\mathbf{b},2\mathbf{c}$	$0,0,1/2$

[3] $\mathbf{c}' = 3\mathbf{c}$

$P\bar{3}$ (147)	$\langle 2;\ 4\rangle$	$\mathbf{a},\mathbf{b},3\mathbf{c}$	
$P\bar{3}$ (147)	$\langle 2;\ 4+(0,0,2)\rangle$	$\mathbf{a},\mathbf{b},3\mathbf{c}$	$0,0,1$
$P\bar{3}$ (147)	$\langle 2;\ 4+(0,0,4)\rangle$	$\mathbf{a},\mathbf{b},3\mathbf{c}$	$0,0,2$

[3] $\mathbf{a}' = 3\mathbf{a},\ \mathbf{b}' = 3\mathbf{b}$

$H\bar{3}$ (147, $P\bar{3}$)	$\langle 2;\ 4\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	
$H\bar{3}$ (147, $P\bar{3}$)	$\langle 2+(1,-1,0);\ 4+(2,0,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$1,0,0$
$H\bar{3}$ (147, $P\bar{3}$)	$\langle 2+(2,-2,0);\ 4+(4,0,0)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},\mathbf{c}$	$2,0,0$

[3] $\mathbf{a}' = \mathbf{a}-\mathbf{b},\ \mathbf{b}' = \mathbf{a}+2\mathbf{b},\ \mathbf{c}' = 3\mathbf{c}$

$R\bar{3}$ (148)	$\langle 2;\ 4\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},3\mathbf{c}$	
$R\bar{3}$ (148)	$\langle 2;\ 4+(0,0,2)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},3\mathbf{c}$	$0,0,1$
$R\bar{3}$ (148)	$\langle 2;\ 4+(0,0,4)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+2\mathbf{b},3\mathbf{c}$	$0,0,2$

[3] $\mathbf{a}' = 2\mathbf{a}+\mathbf{b},\ \mathbf{b}' = -\mathbf{a}+\mathbf{b},\ \mathbf{c}' = 3\mathbf{c}$

$R\bar{3}$ (148)	$\langle 2;\ 4\rangle$	$2\mathbf{a}+\mathbf{b},-\mathbf{a}+\mathbf{b},3\mathbf{c}$	
$R\bar{3}$ (148)	$\langle 2;\ 4+(0,0,2)\rangle$	$2\mathbf{a}+\mathbf{b},-\mathbf{a}+\mathbf{b},3\mathbf{c}$	$0,0,1$
$R\bar{3}$ (148)	$\langle 2;\ 4+(0,0,4)\rangle$	$2\mathbf{a}+\mathbf{b},-\mathbf{a}+\mathbf{b},3\mathbf{c}$	$0,0,2$

[4] $\mathbf{a}' = 2\mathbf{a},\ \mathbf{b}' = 2\mathbf{b}$

$P\bar{3}$ (147)	$\langle 2;\ 4\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	
$P\bar{3}$ (147)	$\langle 2+(1,-1,0);\ 4+(2,0,0)\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	$1,0,0$
$P\bar{3}$ (147)	$\langle 2+(1,2,0);\ 4+(0,2,0)\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	$0,1,0$
$P\bar{3}$ (147)	$\langle 2+(2,1,0);\ 4+(2,2,0)\rangle$	$2\mathbf{a},2\mathbf{b},\mathbf{c}$	$1,1,0$

- **Series of maximal isomorphic subgroups**

[p] $\mathbf{c}' = p\mathbf{c}$

$P\bar{3}$ (147)	$\langle 2;\ 4+(0,0,2u)\rangle$ prime $p>2$; $0\le u<p$ p conjugate subgroups	$\mathbf{a},\mathbf{b},p\mathbf{c}$	$0,0,u$

[p^2] $\mathbf{a}' = p\mathbf{a},\ \mathbf{b}' = p\mathbf{b}$

$P\bar{3}$ (147)	$\langle 2+(u+v,-u+2v,0);\ 4+(2u,2v,0)\rangle$ p prime; $0\le u<p$; $0\le v<p$ p^2 conjugate subgroups for $p=2$ or $p=6n-1$	$p\mathbf{a},p\mathbf{b},\mathbf{c}$	$u,v,0$

[$p=q^2+r^2+qr$] $\mathbf{a}' = q\mathbf{a}-r\mathbf{b},\ \mathbf{b}' = r\mathbf{a}+(q+r)\mathbf{b}$

$P\bar{3}$ (147)	$\langle 2+(u,-u,0);\ 4+(2u,0,0)\rangle$ prime $p=3$ or $p=6n+1$; $q>0$; $r>0$; $0\le u<p$ p conjugate subgroups for each pair of q and r	$q\mathbf{a}-r\mathbf{b},r\mathbf{a}+(q+r)\mathbf{b},\mathbf{c}$	$u,0,0$

I Minimal *translationengleiche* supergroups

[2] $P\bar{3}1m$ (162); [2] $P\bar{3}1c$ (163); [2] $P\bar{3}m1$ (164); [2] $P\bar{3}c1$ (165); [2] $P6/m$ (175); [2] $P6_3/m$ (176)

II Minimal non-isomorphic *klassengleiche* supergroups

- **Additional centring translations**

[3] $R_{\rm obv}\bar{3}$ (148, $R\bar{3}$); [3] $R_{\rm rev}\bar{3}$ (148, $R\bar{3}$)

- **Decreased unit cell** none

