$P4_2nm$ No. 102 $P4_2nm$ C_{4v}^4

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (3); (5)

General position

Multiplicity, Wyckoff letter, Site symmetry		Coordinates			
8 d 1	(1) x,y,z	(2) $\bar{x},\bar{y},z$	(3) $\bar{y}+\frac{1}{2},x+\frac{1}{2},z+\frac{1}{2}$	(4) $y+\frac{1}{2},\bar{x}+\frac{1}{2},z+\frac{1}{2}$	
	(5) $x+\frac{1}{2},\bar{y}+\frac{1}{2},z+\frac{1}{2}$	(6) $\bar{x}+\frac{1}{2},y+\frac{1}{2},z+\frac{1}{2}$	(7) $\bar{y},\bar{x},z$	(8) y,x,z	

I Maximal *translationengleiche* subgroups

[2] $P4_211$ (77, $P4_2$)	1; 2; 3; 4		$0,1/2,0$
[2] $P2\bar{1}m$ (35, $Cmm2$)	1; 2; 7; 8	$\mathbf{a}-\mathbf{b},\mathbf{a}+\mathbf{b},\mathbf{c}$	
[2] $P2n1$ (34, $Pnn2$)	1; 2; 5; 6		

II Maximal *klassengleiche* subgroups

- **Enlarged unit cell**

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

$F4_1dc$ (110, $I4_1cd$)	$\langle 2;\ 3;\ 5+(0,0,1)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+\mathbf{b},2\mathbf{c}$	
$F4_1dc$ (110, $I4_1cd$)	$\langle 2;\ 5;\ 3+(0,0,1)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+\mathbf{b},2\mathbf{c}$	$1/2,1/2,0$
$F4_1dm$ (109, $I4_1md$)	$\langle 2;\ 3;\ 5\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+\mathbf{b},2\mathbf{c}$	
$F4_1dm$ (109, $I4_1md$)	$\langle 2;\ (3;\ 5)+(0,0,1)\rangle$	$\mathbf{a}-\mathbf{b},\mathbf{a}+\mathbf{b},2\mathbf{c}$	$1/2,1/2,0$

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

$P4_2nm$ (102)	$\langle 2;\ (3;\ 5)+(0,0,1)\rangle$	$\mathbf{a},\mathbf{b},3\mathbf{c}$	

- **Series of maximal isomorphic subgroups**

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

$P4_2nm$ (102)	$\langle 2;\ (3;\ 5)+(0,0,\frac{p}{2}-\frac{1}{2})\rangle$ $p>2$ no conjugate subgroups	$\mathbf{a},\mathbf{b},p\mathbf{c}$	

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

$P4_2nm$ (102)	$\langle 2+(2u,2v,0);\ 3+(\frac{p}{2}-\frac{1}{2}+u+v,\frac{p}{2}-\frac{1}{2}-u+v,0);$ $5+(\frac{p}{2}-\frac{1}{2},\frac{p}{2}-\frac{1}{2}+2v,0)\rangle$ $p>2;\ 0\le u<p;\ 0\le v<p$ p^2 conjugate subgroups for the prime p	$p\mathbf{a},p\mathbf{b},\mathbf{c}$	$u,v,0$

I Minimal *translationengleiche* supergroups

[2] $P4_2/nnm$ (134); [2] $P4_2/mnm$ (136)

II Minimal non-isomorphic *klassengleiche* supergroups

- **Additional centring translations**

[2] $C4_2cm$ (105, $P4_2mc$); [2] $I4mm$ (107)

- **Decreased unit cell**

[2] $\mathbf{c}'=\frac{1}{2}\mathbf{c}$ $P4bm$ (100)