D_{2d}^9 $I\bar{4}m2$ No. 119 $I\bar{4}m2$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(\frac{1}{2},\frac{1}{2},\frac{1}{2})$; (2); (3); (5)

General position

Multiplicity, Wyckoff letter, Site symmetry	Coordinates $(0,0,0)+$ $(\frac{1}{2},\frac{1}{2},\frac{1}{2})+$			
16 j 1	(1) x,y,z	(2) $\bar{x},\bar{y},z$	(3) $y,\bar{x},\bar{z}$	(4) $\bar{y},x,\bar{z}$
	(5) $x,\bar{y},z$	(6) $\bar{x},y,z$	(7) $y,x,\bar{z}$	(8) $\bar{y},\bar{x},\bar{z}$

I Maximal *translationengleiche* subgroups

[2] $I\bar{4}11$ (82, $I\bar{4}$)	(1; 2; 3; 4)+		
[2] $I2m1$ (44, $Imm2$)	(1; 2; 5; 6)+		
[2] $I212$ (22, $F222$)	(1; 2; 7; 8)+	$\mathbf{a}-\mathbf{b},\mathbf{a}+\mathbf{b},\mathbf{c}$	

II Maximal *klassengleiche* subgroups

- **Loss of centring translations**

[2] $P\bar{4}n2$ (118)	1; 2; 3; 4; (5; 6; 7; 8) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$		
[2] $P\bar{4}n2$ (118)	1; 2; 7; 8; (3; 4; 5; 6) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$		$0,1/2,1/4$
[2] $P\bar{4}m2$ (115)	1; 2; 3; 4; 5; 6; 7; 8		
[2] $P\bar{4}m2$ (115)	1; 2; 5; 6; (3; 4; 7; 8) + $(\frac{1}{2},\frac{1}{2},\frac{1}{2})$		$0,1/2,1/4$

- **Enlarged unit cell**

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

$I\bar{4}m2$ (119)	$\langle 2;\ 3;\ 5\rangle$	$\mathbf{a},\mathbf{b},3\mathbf{c}$	
$I\bar{4}m2$ (119)	$\langle 2;\ 5;\ 3+(0,0,2)\rangle$	$\mathbf{a},\mathbf{b},3\mathbf{c}$	$0,0,1$
$I\bar{4}m2$ (119)	$\langle 2;\ 5;\ 3+(0,0,4)\rangle$	$\mathbf{a},\mathbf{b},3\mathbf{c}$	$0,0,2$

- **Series of maximal isomorphic subgroups**

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

$I\bar{4}m2$ (119)	$\langle 2;\ 5;\ 3+(0,0,2u)\rangle$ $p>2;\ 0\le u<p$ p conjugate subgroups for the prime p	$\mathbf{a},\mathbf{b},p\mathbf{c}$	$0,0,u$

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

$I\bar{4}m2$ (119)	$\langle 2+(2u,2v,0);\ 3+(u-v,u+v,0);\ 5+(0,2v,0)\rangle$ $p>2;\ 0\le u<p;\ 0\le v<p$ p^2 conjugate subgroups for the prime p	$p\mathbf{a},p\mathbf{b},\mathbf{c}$	$u,v,0$

I Minimal *translationengleiche* supergroups

[2] $I4/mmm$ (139); [2] $I4_1/amd$ (141); [3] $F\bar{4}3m$ (216)

II Minimal non-isomorphic *klassengleiche* supergroups

- **Additional centring translations** none

- **Decreased unit cell**

[2] $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ $C\bar{4}m2$ (111, $P\bar{4}2m$)