

$Pna2_1$

No. 33

 $Pna2_1$ C_{2v}^9 Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (3)

General position

Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

4 a 1 (1) x, y, z (2) $\bar{x}, \bar{y}, z + \frac{1}{2}$ (3) $x + \frac{1}{2}, \bar{y} + \frac{1}{2}, z$ (4) $\bar{x} + \frac{1}{2}, y + \frac{1}{2}, z + \frac{1}{2}$ I Maximal *translationengleiche* subgroups

[2] $P1a1$ (7, $P1c1$)	1; 3	$-\mathbf{a} - \mathbf{c}, \mathbf{b}, \mathbf{a}$	0, 1/4, 0
[2] $Pn11$ (7, $P1c1$)	1; 4	$\mathbf{b}, \mathbf{a}, -\mathbf{b} - \mathbf{c}$	1/4, 0, 0
[2] $P112_1$ (4)	1; 2		

II Maximal *klassengleiche* subgroups

• Enlarged unit cell

[3] $\mathbf{a}' = 3\mathbf{a}$			
$\left\{ \begin{array}{l} Pna2_1 (33) \\ Pna2_1 (33) \\ Pna2_1 (33) \end{array} \right.$	$\langle 2; 3 + (1, 0, 0) \rangle$ $\langle 2 + (2, 0, 0); 3 + (1, 0, 0) \rangle$ $\langle 2 + (4, 0, 0); 3 + (1, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$ $3\mathbf{a}, \mathbf{b}, \mathbf{c}$ $3\mathbf{a}, \mathbf{b}, \mathbf{c}$	 1, 0, 0 2, 0, 0
[3] $\mathbf{b}' = 3\mathbf{b}$			
$\left\{ \begin{array}{l} Pna2_1 (33) \\ Pna2_1 (33) \\ Pna2_1 (33) \end{array} \right.$	$\langle 2; 3 + (0, 1, 0) \rangle$ $\langle 2 + (0, 2, 0); 3 + (0, 3, 0) \rangle$ $\langle 2 + (0, 4, 0); 3 + (0, 5, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	 0, 1, 0 0, 2, 0
[3] $\mathbf{c}' = 3\mathbf{c}$			
$Pna2_1 (33)$	$\langle 3; 2 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	

• Series of maximal isomorphic subgroups

[p] $\mathbf{a}' = p\mathbf{a}$			
$Pna2_1 (33)$	$\langle 2 + (2u, 0, 0); 3 + (\frac{p}{2} - \frac{1}{2}, 0, 0) \rangle$ prime $p > 2$; $0 \leq u < p$ p conjugate subgroups	$p\mathbf{a}, \mathbf{b}, \mathbf{c}$	$u, 0, 0$
[p] $\mathbf{b}' = p\mathbf{b}$			
$Pna2_1 (33)$	$\langle 2 + (0, 2u, 0); 3 + (0, \frac{p}{2} - \frac{1}{2} + 2u, 0) \rangle$ prime $p > 2$; $0 \leq u < p$ p conjugate subgroups	$\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$0, u, 0$
[p] $\mathbf{c}' = p\mathbf{c}$			
$Pna2_1 (33)$	$\langle 3; 2 + (0, 0, \frac{p}{2} - \frac{1}{2}) \rangle$ prime $p > 2$ no conjugate subgroups	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	

I Minimal *translationengleiche* supergroups[2] $Pnma$ (52); [2] $Pccn$ (56); [2] $Pbcn$ (60); [2] $Pnma$ (62)II Minimal non-isomorphic *klassengleiche* supergroups

• Additional centring translations

[2] $Ccm2_1$ (36, $Cmc2_1$); [2] $Ama2$ (40); [2] $Bbe2$ (41, $Aea2$); [2] $Ima2$ (46)

• Decreased unit cell

[2] $\mathbf{b}' = \frac{1}{2}\mathbf{b}$ $Pca2_1$ (29); [2] $\mathbf{a}' = \frac{1}{2}\mathbf{a}$ $Pnm2_1$ (31, $Pmn2_1$); [2] $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ $Pba2$ (32)