

$P3_221$

No. 154

 $P3_221$
 D_3^6
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 c 1

 (1) x, y, z (2) $\bar{y}, x - y, z + \frac{2}{3}$ (3) $\bar{x} + y, \bar{x}, z + \frac{1}{3}$
 (4) y, x, \bar{z} (5) $x - y, \bar{y}, \bar{z} + \frac{1}{3}$ (6) $\bar{x}, \bar{x} + y, \bar{z} + \frac{2}{3}$
I Maximal translationengleiche subgroups

[2] $P3_211$ (145, $P3_2$)	1; 2; 3		
[3] $P121$ (5, $C121$)	1; 4	$-\mathbf{a} + \mathbf{b}, -\mathbf{a} - \mathbf{b}, \mathbf{c}$	
[3] $P121$ (5, $C121$)	1; 6	$2\mathbf{a} + \mathbf{b}, \mathbf{b}, \mathbf{c}$	0, 0, 1/3
[3] $P121$ (5, $C121$)	1; 5	$-\mathbf{a} - 2\mathbf{b}, \mathbf{a}, \mathbf{c}$	0, 0, 2/3

II Maximal klassengleiche subgroups

• Enlarged unit cell

[2] $\mathbf{c}' = 2\mathbf{c}$			
$P3_121$ (152)	$\langle 2; 4 \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
$P3_121$ (152)	$\langle 2; 4 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	0, 0, 1/2
[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$			
$H3_221$ (153, $P3_212$)	$\langle 2; 4 \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	0, 0, 1/6
[4] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$			
$P3_221$ (154)	$\langle 2; 4 \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	
$P3_221$ (154)	$\langle (2; 4) + (1, -1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	1, 0, 0
$P3_221$ (154)	$\langle 2 + (1, 2, 0); 4 + (-1, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	0, 1, 0
$P3_221$ (154)	$\langle 4; 2 + (2, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	1, 1, 0

• Series of maximal isomorphic subgroups

[p] $\mathbf{c}' = p\mathbf{c}$			
$P3_221$ (154)	$\langle 2 + (0, 0, \frac{2p}{3} - \frac{2}{3}); 4 + (0, 0, 2u) \rangle$ $p > 6; 0 \leq u < p$	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	0, 0, u
$P3_121$ (152)	$\langle 2 + (0, 0, \frac{p}{3} - \frac{2}{3}); 4 + (0, 0, 2u) \rangle$ $p > 2; 0 \leq u < p$ p conjugate subgroups for prime $p \equiv 1 \pmod{3}$	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	0, 0, u
[p^2] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$			
$P3_221$ (154)	$\langle 2 + (u + v, -u + 2v, 0); 4 + (u - v, -u + v, 0) \rangle$ $p > 1; p \neq 3; 0 \leq u < p; 0 \leq v < p$ p^2 conjugate subgroups for the prime p	$p\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$u, v, 0$

I Minimal translationengleiche supergroups

 [2] $P6_522$ (179); [2] $P6_222$ (180)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

 [3] $H3_221$ (153, $P3_212$); [3] $R_{\text{obv}}32$ (155, $R32$); [3] $R_{\text{rev}}32$ (155, $R32$)

• Decreased unit cell

 [3] $\mathbf{c}' = \frac{1}{3}\mathbf{c}$ $P321$ (150)