

$P6_522$

No. 179

 $P6_522$
 D_6^3
Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (4); (7)

General position

 Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

12	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) $\bar{x}, \bar{y}, z + \frac{1}{2}$	(5) $y, \bar{x} + y, z + \frac{1}{6}$	(6) $x - y, x, z + \frac{5}{6}$
			(7) $y, x, \bar{z} + \frac{2}{3}$	(8) $x - y, \bar{y}, \bar{z}$	(9) $\bar{x}, \bar{x} + y, \bar{z} + \frac{1}{3}$
			(10) $\bar{y}, \bar{x}, \bar{z} + \frac{1}{6}$	(11) $\bar{x} + y, y, \bar{z} + \frac{1}{2}$	(12) $x, x - y, \bar{z} + \frac{5}{6}$

I Maximal translationengleiche subgroups

[2] $P6_511$ (170, $P6_5$)	1; 2; 3; 4; 5; 6		
[2] $P3_221$ (154)	1; 2; 3; 7; 8; 9		0, 0, 1/3
[2] $P3_212$ (153)	1; 2; 3; 10; 11; 12		0, 0, 5/12
{ [3] $P2_122$ (20, $C222_1$)	1; 4; 7; 10	$-\mathbf{a} + \mathbf{b}, -\mathbf{a} - \mathbf{b}, \mathbf{c}$	0, 0, 1/12
{ [3] $P2_122$ (20, $C222_1$)	1; 4; 8; 11	$-\mathbf{a} - 2\mathbf{b}, \mathbf{a}, \mathbf{c}$	0, 0, 3/4
{ [3] $P2_122$ (20, $C222_1$)	1; 4; 9; 12	$2\mathbf{a} + \mathbf{b}, \mathbf{b}, \mathbf{c}$	0, 0, 5/12

II Maximal klassengleiche subgroups

• Enlarged unit cell

[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$			
{ $H6_522$ (179, $P6_522$)	$\langle 2; 4; 7 + (0, 0, 1) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	0, 0, 7/12
{ $H6_522$ (179, $P6_522$)	$\langle 2 + (1, -1, 0); 4 + (2, 0, 0); 7 + (1, -1, 1) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	1, 0, 7/12
{ $H6_522$ (179, $P6_522$)	$\langle 2 + (2, -2, 0); 4 + (4, 0, 0); 7 + (2, -2, 1) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$	2, 0, 7/12
[4] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$			
{ $P6_522$ (179)	$\langle 2; 4; 7 \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	
{ $P6_522$ (179)	$\langle (2; 7) + (1, -1, 0); 4 + (2, 0, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	1, 0, 0
{ $P6_522$ (179)	$\langle 2 + (1, 2, 0); 4 + (0, 2, 0); 7 + (-1, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	0, 1, 0
{ $P6_522$ (179)	$\langle 7; 2 + (2, 1, 0); 4 + (2, 2, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	1, 1, 0

• Series of maximal isomorphic subgroups

[p] $\mathbf{c}' = p\mathbf{c}$			
$P6_522$ (179)	$\langle 2 + (0, 0, \frac{2p}{3} - \frac{2}{3}); 4 + (0, 0, \frac{p}{2} - \frac{1}{2}); 7 + (0, 0, \frac{2p}{3} - \frac{2}{3} + 2u) \rangle$ $p > 6; 0 \leq u < p$ p conjugate subgroups for prime $p \equiv 1 \pmod{6}$	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	0, 0, u
$P6_122$ (178)	$\langle 2 + (0, 0, \frac{p}{3} - \frac{2}{3}); 4 + (0, 0, \frac{p}{2} - \frac{1}{2}); 7 + (0, 0, \frac{p}{3} - \frac{2}{3} + 2u) \rangle$ $p > 4; 0 \leq u < p$ p conjugate subgroups for prime $p \equiv 5 \pmod{6}$	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	0, 0, u
[p^2] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$			
$P6_522$ (179)	$\langle 2 + (u + v, -u + 2v, 0); 4 + (2u, 2v, 0); 7 + (u - v, -u + v, 0) \rangle$ $p > 1; p \neq 3; 0 \leq u < p; 0 \leq v < p$ p^2 conjugate subgroups for the prime p	$p\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$u, v, 0$

I Minimal translationengleiche supergroups

none

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

none

• Decreased unit cell

 [2] $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ $P6_422$ (181); [3] $\mathbf{c}' = \frac{1}{3}\mathbf{c}$ $P6_322$ (182)