

$p3m1$

No. 14

$p3m1$

**Generators selected** (1);  $t(1,0)$ ;  $t(0,1)$ ; (2); (4)

**General position**

Multiplicity,  
Wyckoff letter,  
Site symmetry

Coordinates

6  $e$  1

(1)  $x, y$  (2)  $\bar{y}, x - y$  (3)  $\bar{x} + y, \bar{x}$   
(4)  $\bar{y}, \bar{x}$  (5)  $\bar{x} + y, y$  (6)  $x, x - y$

**I Maximal translationengleiche subgroups**

[2] $p311$ (13, $p3$ )	1; 2; 3	
{ [3] $p1m1$ (5, $cm$ )	1; 4	$\mathbf{a} + \mathbf{b}, -\mathbf{a} + \mathbf{b}$
[3] $p1m1$ (5, $cm$ )	1; 5	$-\mathbf{a}, -\mathbf{a} - 2\mathbf{b}$
[3] $p1m1$ (5, $cm$ )	1; 6	$-\mathbf{b}, 2\mathbf{a} + \mathbf{b}$

**II Maximal klassengleiche subgroups**

• **Enlarged unit cell**

[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 3\mathbf{b}$			
{ $h3m1$ (15, $p31m$ )	$\langle 2; 4 \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}$	
{ $h3m1$ (15, $p31m$ )	$\langle 2 + (1, -1); 4 + (1, 1) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}$	1, 0
{ $h3m1$ (15, $p31m$ )	$\langle 2 + (2, -2); 4 + (2, 2) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}$	2, 0
{ $h3m1$ (15, $p31m$ )	$\langle 4; 2 + (0, 1) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}$	$-1/3, 1/3$
{ $h3m1$ (15, $p31m$ )	$\langle 2 + (1, 0); 4 + (1, 1) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}$	$2/3, 1/3$
{ $h3m1$ (15, $p31m$ )	$\langle 2 + (2, -1); 4 + (2, 2) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}$	$5/3, 1/3$
{ $h3m1$ (15, $p31m$ )	$\langle 4; 2 + (0, 2) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}$	$-2/3, 2/3$
{ $h3m1$ (15, $p31m$ )	$\langle (2; 4) + (1, 1) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}$	$1/3, 2/3$
{ $h3m1$ (15, $p31m$ )	$\langle 2 + (2, 0); 4 + (2, 2) \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}$	$4/3, 2/3$

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

{ $p3m1$ (14)	$\langle 2; 4 \rangle$	$2\mathbf{a}, 2\mathbf{b}$	
{ $p3m1$ (14)	$\langle 2 + (1, -1); 4 + (1, 1) \rangle$	$2\mathbf{a}, 2\mathbf{b}$	1, 0
{ $p3m1$ (14)	$\langle 2 + (1, 2); 4 + (1, 1) \rangle$	$2\mathbf{a}, 2\mathbf{b}$	0, 1
{ $p3m1$ (14)	$\langle 2 + (2, 1); 4 + (2, 2) \rangle$	$2\mathbf{a}, 2\mathbf{b}$	1, 1

• **Series of maximal isomorphic subgroups**

$[p^2] \mathbf{a}' = p\mathbf{a}, \mathbf{b}' = p\mathbf{b}$			
$p3m1$ (14)	$\langle 2 + (u + v, -u + 2v); 4 + (u + v, u + v) \rangle$	$p\mathbf{a}, p\mathbf{b}$	$u, v$
	$p$ prime; $p \neq 3$ ; $0 \leq u < p$ ; $0 \leq v < p$		
	$p^2$ conjugate subgroups		

**I Minimal translationengleiche supergroups**

[2]  $p6mm$  (17)

**II Minimal non-isomorphic klassengleiche supergroups**

• **Additional centring translations**

[3]  $h3m1$  (15,  $p31m$ )

• **Decreased unit cell**

none