

$D_{3h}^3$  $P\bar{6}2m$ 

No. 189

 $P\bar{6}2m$ **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	$l$	(1) $x,y,z$ (2) $\bar{x},x-y,z$ (3) $\bar{x}+y,\bar{x},z$ (4) $x,y,\bar{z}$ (5) $\bar{y},x-y,\bar{z}$ (6) $\bar{x}+y,\bar{x},\bar{z}$ (7) $y,x,\bar{z}$ (8) $x-y,\bar{y},\bar{z}$ (9) $\bar{x},\bar{x}+y,\bar{z}$ (10) $y,x,z$ (11) $x-y,\bar{y},z$ (12) $\bar{x},\bar{x}+y,z$

**I Maximal translationengleiche subgroups**

[2] $P\bar{6}11$ (174, $P\bar{6}$ )	1; 2; 3; 4; 5; 6	
[2] $P31m$ (157)	1; 2; 3; 10; 11; 12	
[2] $P321$ (150)	1; 2; 3; 7; 8; 9	
{ [3] $Pm2m$ (38, $Amm2$ )	1; 4; 7; 10	$\mathbf{c}, -\mathbf{a} + \mathbf{b}, -\mathbf{a} - \mathbf{b}$
{ [3] $Pm2m$ (38, $Amm2$ )	1; 4; 8; 11	$\mathbf{c}, -\mathbf{a} - 2\mathbf{b}, \mathbf{a}$
{ [3] $Pm2m$ (38, $Amm2$ )	1; 4; 9; 12	$\mathbf{c}, 2\mathbf{a} + \mathbf{b}, \mathbf{b}$

**II Maximal klassengleiche subgroups****• Enlarged unit cell**

[2] $\mathbf{c}' = 2\mathbf{c}$		
$P\bar{6}2c$ (190)	$\langle 2; 7; 4 + (0,0,1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$
$P\bar{6}2c$ (190)	$\langle 2; 4; 7 + (0,0,1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$
$P\bar{6}2m$ (189)	$\langle 2; 4; 7 \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$
$P\bar{6}2m$ (189)	$\langle 2; (4; 7) + (0,0,1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$
[3] $\mathbf{c}' = 3\mathbf{c}$		
{ $P\bar{6}2m$ (189)	$\langle 2; 4; 7 \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$
{ $P\bar{6}2m$ (189)	$\langle 2; (4; 7) + (0,0,2) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$
{ $P\bar{6}2m$ (189)	$\langle 2; (4; 7) + (0,0,4) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$
[3] $\mathbf{a}' = 3\mathbf{a}$ , $\mathbf{b}' = 3\mathbf{b}$		
$H\bar{6}2m$ (187, $P\bar{6}m2$ )	$\langle 2; 4; 7 \rangle$	$\mathbf{a} - \mathbf{b}, \mathbf{a} + 2\mathbf{b}, \mathbf{c}$
[4] $\mathbf{a}' = 2\mathbf{a}$ , $\mathbf{b}' = 2\mathbf{b}$		
{ $P\bar{6}2m$ (189)	$\langle 2; 4; 7 \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$
{ $P\bar{6}2m$ (189)	$\langle 4; (2; 7) + (1, -1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$
{ $P\bar{6}2m$ (189)	$\langle 4; 2 + (1, 2, 0); 7 + (-1, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$
{ $P\bar{6}2m$ (189)	$\langle 4; 7; 2 + (2, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$

**• Series of maximal isomorphic subgroups**

[p] $\mathbf{c}' = p\mathbf{c}$		
$P\bar{6}2m$ (189)	$\langle 2; (4; 7) + (0,0,2u) \rangle$	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$
	$p > 1; 0 \leq u < p$	$0, 0, u$
	$p$ conjugate subgroups for the prime $p$	
[ $p^2$ ] $\mathbf{a}' = p\mathbf{a}$ , $\mathbf{b}' = p\mathbf{b}$		
$P\bar{6}2m$ (189)	$\langle 4; 2 + (u+v, -u+2v, 0); 7 + (u-v, -u+v, 0) \rangle$	$p\mathbf{a}, p\mathbf{b}, \mathbf{c}$
	$p > 1; p \neq 3; 0 \leq u < p; 0 \leq v < p$	$u, v, 0$
	$p^2$ conjugate subgroups for the prime $p$	

**I Minimal translationengleiche supergroups**[2]  $P6/mmm$  (191); [2]  $P6_3/mcm$  (193)**II Minimal non-isomorphic klassengleiche supergroups****• Additional centring translations**[3]  $H\bar{6}2m$  (187,  $P\bar{6}m2$ )**• Decreased unit cell**