

Pm

No. 6

 $P1m1$
 C_s^1

 UNIQUE AXIS b
Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2)

General position

 Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

 2 c 1

 (1) x, y, z (2) x, \bar{y}, z
I Maximal translationengleiche subgroups

 [2] $P1$ (1) 1

II Maximal klassengleiche subgroups

• Enlarged unit cell

[2] $\mathbf{b}' = 2\mathbf{b}$			
$P1m1$ (6)	$\langle 2 \rangle$	$\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	
$P1m1$ (6)	$\langle 2 + (0, 1, 0) \rangle$	$\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	0, 1/2, 0
[2] $\mathbf{c}' = 2\mathbf{c}$			
$P1c1$ (7)	$\langle 2 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
$P1m1$ (6)	$\langle 2 \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
[2] $\mathbf{a}' = 2\mathbf{a}$			
$P1a1$ (7, $P1c1$)	$\langle 2 + (1, 0, 0) \rangle$	$-2\mathbf{a} - \mathbf{c}, \mathbf{b}, 2\mathbf{a}$	
$P1m1$ (6)	$\langle 2 \rangle$	$2\mathbf{a}, \mathbf{b}, \mathbf{c}$	
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{c}' = 2\mathbf{c}$			
$B1e1$ (7, $P1c1$)	$\langle 2 + (0, 0, 1) \rangle$	$\mathbf{a} - \mathbf{c}, \mathbf{b}, 2\mathbf{c}$	
$B1m1$ (6, $P1m1$)	$\langle 2 \rangle$	$\mathbf{a} - \mathbf{c}, \mathbf{b}, 2\mathbf{c}$	
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$			
$C1m1$ (8)	$\langle 2 \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	
$C1m1$ (8)	$\langle 2 + (0, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	0, 1/2, 0
[2] $\mathbf{b}' = 2\mathbf{b}, \mathbf{c}' = 2\mathbf{c}$			
$A1m1$ (8, $C1m1$)	$\langle 2 \rangle$	$2\mathbf{c}, 2\mathbf{b}, -\mathbf{a} - 2\mathbf{c}$	
$A1m1$ (8, $C1m1$)	$\langle 2 + (0, 1, 0) \rangle$	$2\mathbf{c}, 2\mathbf{b}, -\mathbf{a} - 2\mathbf{c}$	0, 1/2, 0
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}, \mathbf{c}' = 2\mathbf{c}$			
$F1m1$ (8, $C1m1$)	$\langle 2 \rangle$	$2\mathbf{a}, 2\mathbf{b}, -\mathbf{a} + \mathbf{c}$	
$F1m1$ (8, $C1m1$)	$\langle 2 + (0, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, -\mathbf{a} + \mathbf{c}$	0, 1/2, 0
[3] $\mathbf{b}' = 3\mathbf{b}$			
$P1m1$ (6)	$\langle 2 \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	
$P1m1$ (6)	$\langle 2 + (0, 2, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	0, 1, 0
$P1m1$ (6)	$\langle 2 + (0, 4, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	0, 2, 0
[3] $\mathbf{c}' = 3\mathbf{c}$			
$P1m1$ (6)	$\langle 2 \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	
[3] $\mathbf{a}' = \mathbf{a} - \mathbf{c}, \mathbf{c}' = 3\mathbf{c}$			
$P1m1$ (6)	$\langle 2 \rangle$	$\mathbf{a} - \mathbf{c}, \mathbf{b}, 3\mathbf{c}$	
[3] $\mathbf{a}' = \mathbf{a} - 2\mathbf{c}, \mathbf{c}' = 3\mathbf{c}$			
$P1m1$ (6)	$\langle 2 \rangle$	$\mathbf{a} - 2\mathbf{c}, \mathbf{b}, 3\mathbf{c}$	
[3] $\mathbf{a}' = 3\mathbf{a}$			
$P1m1$ (6)	$\langle 2 \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$	
• Series of maximal isomorphic subgroups			
[p] $\mathbf{b}' = p\mathbf{b}$			
$P1m1$ (6)	$\langle 2 + (0, 2u, 0) \rangle$	$\mathbf{a}, p\mathbf{b}, \mathbf{c}$	0, u , 0
	prime $p > 2$; $0 \leq u < p$		
	p conjugate subgroups		
[p] $\mathbf{a}' = \mathbf{a} - q\mathbf{c}, \mathbf{c}' = p\mathbf{c}$			
$P1m1$ (6)	$\langle 2 \rangle$	$\mathbf{a} - q\mathbf{c}, \mathbf{b}, p\mathbf{c}$	
	p prime; $0 \leq q < p$		
	no conjugate subgroups		
[p] $\mathbf{a}' = p\mathbf{a}$			
$P1m1$ (6)	$\langle 2 \rangle$	$p\mathbf{a}, \mathbf{b}, \mathbf{c}$	
	p prime		
	no conjugate subgroups		

I Minimal translationengleiche supergroups

[2] $P12/m1$ (10); [2] $P12_1/m1$ (11); [2] $Pmm2$ (25); [2] $Pmc2_1$ (26); [2] $Pma2$ (28); [2] $Pmn2_1$ (31); [2] $Amm2$ (38); [2] $Ama2$ (40);
 [3] $P\bar{6}$ (174)

II Minimal non-isomorphic klassengleiche supergroups

- Additional centring translations

[2] $C1m1$ (8); [2] $A1m1$ (8, $C1m1$); [2] $I1m1$ (8, $C1m1$)

- Decreased unit cell

none

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I Minimal translationengleiche supergroups

[2] $P112/m$ (10); [2] $P112_1/m$ (11); [2] $Pmm2$ (25); [2] $Pmc2_1$ (26); [2] $Pma2$ (28); [2] $Pmn2_1$ (31); [2] $Amm2$ (38); [2] $Ama2$ (40);
 [3] $P\bar{6}$ (174)

II Minimal non-isomorphic klassengleiche supergroups

- Additional centring translations

[2] $A11m$ (8); [2] $B11m$ (8, $A11m$); [2] $I11m$ (8, $A11m$)

- Decreased unit cell

none

UNIQUE AXIS *c*

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

General position

Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

2 *c* 1

(1) x, y, z (2) x, y, \bar{z}

I Maximal translationengleiche subgroups

[2] *P1* (1) 1

II Maximal klassengleiche subgroups

• **Enlarged unit cell**

[2] $c' = 2c$			
<i>P11m</i> (6)	$\langle 2 \rangle$	a, b, 2c	
<i>P11m</i> (6)	$\langle 2 + (0, 0, 1) \rangle$	a, b, 2c	0, 0, 1/2
[2] $a' = 2a$			
<i>P11a</i> (7)	$\langle 2 + (1, 0, 0) \rangle$	2a, b, c	
<i>P11m</i> (6)	$\langle 2 \rangle$	2a, b, c	
[2] $b' = 2b$			
<i>P11b</i> (7, <i>P11a</i>)	$\langle 2 + (0, 1, 0) \rangle$	2b, -a - 2b, c	
<i>P11m</i> (6)	$\langle 2 \rangle$	a, 2b, c	
[2] $a' = 2a, b' = 2b$			
<i>C11e</i> (7, <i>P11a</i>)	$\langle 2 + (1, 0, 0) \rangle$	2a, -a + b, c	
<i>C11m</i> (6, <i>P11m</i>)	$\langle 2 \rangle$	2a, -a + b, c	
[2] $b' = 2b, c' = 2c$			
<i>A11m</i> (8)	$\langle 2 \rangle$	a, 2b, 2c	
<i>A11m</i> (8)	$\langle 2 + (0, 0, 1) \rangle$	a, 2b, 2c	0, 0, 1/2
[2] $a' = 2a, c' = 2c$			
<i>B11m</i> (8, <i>A11m</i>)	$\langle 2 \rangle$	-2a - b, 2a, 2c	
<i>B11m</i> (8, <i>A11m</i>)	$\langle 2 + (0, 0, 1) \rangle$	-2a - b, 2a, 2c	0, 0, 1/2
[2] $a' = 2a, b' = 2b, c' = 2c$			
<i>F11m</i> (8, <i>A11m</i>)	$\langle 2 \rangle$	a - b, 2b, 2c	
<i>F11m</i> (8, <i>A11m</i>)	$\langle 2 + (0, 0, 1) \rangle$	a - b, 2b, 2c	0, 0, 1/2
[3] $c' = 3c$			
<i>P11m</i> (6)	$\langle 2 \rangle$	a, b, 3c	
<i>P11m</i> (6)	$\langle 2 + (0, 0, 2) \rangle$	a, b, 3c	0, 0, 1
<i>P11m</i> (6)	$\langle 2 + (0, 0, 4) \rangle$	a, b, 3c	0, 0, 2
[3] $a' = 3a$			
<i>P11m</i> (6)	$\langle 2 \rangle$	3a, b, c	
[3] $a' = 3a, b' = -a + b$			
<i>P11m</i> (6)	$\langle 2 \rangle$	3a, -a + b, c	
[3] $a' = 3a, b' = -2a + b$			
<i>P11m</i> (6)	$\langle 2 \rangle$	3a, -2a + b, c	
[3] $b' = 3b$			
<i>P11m</i> (6)	$\langle 2 \rangle$	a, 3b, c	
• Series of maximal isomorphic subgroups			
[<i>p</i>] $c' = pc$			
<i>P11m</i> (6)	$\langle 2 + (0, 0, 2u) \rangle$ prime $p > 2$; $0 \leq u < p$ <i>p</i> conjugate subgroups	a, b, pc	0, 0, <i>u</i>
[<i>p</i>] $a' = pa, b' = -qa + b$			
<i>P11m</i> (6)	$\langle 2 \rangle$ <i>p</i> prime; $0 \leq q < p$ no conjugate subgroups	pa, -qa + b, c	
[<i>p</i>] $b' = pb$			
<i>P11m</i> (6)	$\langle 2 \rangle$ <i>p</i> prime no conjugate subgroups	a, pb, c	

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I Minimal translationengleiche supergroups

[2] $P12/m1$ (10); [2] $P12_1/m1$ (11); [2] $Pmm2$ (25); [2] $Pmc2_1$ (26); [2] $Pma2$ (28); [2] $Pmn2_1$ (31); [2] $Amm2$ (38); [2] $Ama2$ (40);
 [3] $P\bar{6}$ (174)

II Minimal non-isomorphic klassengleiche supergroups

- Additional centring translations

[2] $C1m1$ (8); [2] $A1m1$ (8, $C1m1$); [2] $I1m1$ (8, $C1m1$)

- Decreased unit cell

none

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I Minimal translationengleiche supergroups

[2] $P112/m$ (10); [2] $P112_1/m$ (11); [2] $Pmm2$ (25); [2] $Pmc2_1$ (26); [2] $Pma2$ (28); [2] $Pmn2_1$ (31); [2] $Amm2$ (38); [2] $Ama2$ (40);
 [3] $P\bar{6}$ (174)

II Minimal non-isomorphic klassengleiche supergroups

- Additional centring translations

[2] $A11m$ (8); [2] $B11m$ (8, $A11m$); [2] $I11m$ (8, $A11m$)

- Decreased unit cell

none