

D_{2h}^5
 $P2_1/m2/m2/a$

No. 51

 $Pmma$
Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (3); (5)

General position

 Multiplicity,
 Wyckoff letter,
 Site symmetry

Coordinates

8	<i>l</i>	1	(1) x, y, z	(2) $\bar{x} + \frac{1}{2}, \bar{y}, z$	(3) \bar{x}, y, \bar{z}	(4) $x + \frac{1}{2}, \bar{y}, \bar{z}$
			(5) $\bar{x}, \bar{y}, \bar{z}$	(6) $x + \frac{1}{2}, y, \bar{z}$	(7) x, \bar{y}, z	(8) $\bar{x} + \frac{1}{2}, y, z$

I Maximal translationengleiche subgroups

[2] $Pm2a$ (28, $Pma2$)	1; 3; 6; 8	a, -c, b	
[2] $P2_1ma$ (26, $Pmc2_1$)	1; 4; 6; 7	b, c, a	
[2] $Pmm2$ (25)	1; 2; 7; 8		1/4, 0, 0
[2] $P2_122$ (17, $P222_1$)	1; 2; 3; 4	b, c, a	
[2] $P112/a$ (13)	1; 2; 5; 6		
[2] $P2_1/m11$ (11, $P12_1/m1$)	1; 4; 5; 8	c, a, b	
[2] $P12/m1$ (10)	1; 3; 5; 7		

II Maximal klassengleiche subgroups

• Enlarged unit cell

[2] $\mathbf{b}' = 2\mathbf{b}$			
$Pmmn$ (59)	$\langle 5; (2; 3) + (0, 1, 0) \rangle$	a, 2b, c	
$Pmmn$ (59)	$\langle 2; (3; 5) + (0, 1, 0) \rangle$	a, 2b, c	0, 1/2, 0
$Pbma$ (57, $Pbcm$)	$\langle 2; 5; 3 + (0, 1, 0) \rangle$	c, a, 2b	
$Pbma$ (57, $Pbcm$)	$\langle (2; 3; 5) + (0, 1, 0) \rangle$	c, a, 2b	0, 1/2, 0
$Pbmn$ (53, $Pmna$)	$\langle 3; 5; 2 + (0, 1, 0) \rangle$	2b, c, a	
$Pbmn$ (53, $Pmna$)	$\langle 2; 3; 5 + (0, 1, 0) \rangle$	2b, c, a	0, 1/2, 0
$Pmma$ (51)	$\langle 2; 3; 5 \rangle$	a, 2b, c	
$Pmma$ (51)	$\langle 3; (2; 5) + (0, 1, 0) \rangle$	a, 2b, c	0, 1/2, 0
[2] $\mathbf{c}' = 2\mathbf{c}$			
$Pmca$ (57, $Pbcm$)	$\langle 5; (2; 3) + (0, 0, 1) \rangle$	b, 2c, a	
$Pmca$ (57, $Pbcm$)	$\langle 3; (2; 5) + (0, 0, 1) \rangle$	b, 2c, a	0, 0, 1/2
$Pcma$ (55, $Pbam$)	$\langle 3; 5; 2 + (0, 0, 1) \rangle$	2c, a, b	
$Pcma$ (55, $Pbam$)	$\langle (2; 3; 5) + (0, 0, 1) \rangle$	2c, a, b	0, 0, 1/2
$Pcca$ (54)	$\langle 2; 5; 3 + (0, 0, 1) \rangle$	a, b, 2c	
$Pcca$ (54)	$\langle 2; 3; 5 + (0, 0, 1) \rangle$	a, b, 2c	0, 0, 1/2
$Pmma$ (51)	$\langle 2; 3; 5 \rangle$	a, b, 2c	
$Pmma$ (51)	$\langle 2; (3; 5) + (0, 0, 1) \rangle$	a, b, 2c	0, 0, 1/2
[2] $\mathbf{b}' = 2\mathbf{b}, \mathbf{c}' = 2\mathbf{c}$			
$Aema$ (64, $Cmce$)	$\langle 3; 5; 2 + (0, 0, 1) \rangle$	2b, 2c, a	
$Aema$ (64, $Cmce$)	$\langle (2; 3; 5) + (0, 0, 1) \rangle$	2b, 2c, a	0, 0, 1/2
$Aema$ (64, $Cmce$)	$\langle 2; 5; 3 + (0, 0, 1) \rangle$	2b, 2c, a	0, 1/2, 1/2
$Aema$ (64, $Cmce$)	$\langle 2; 3; 5 + (0, 0, 1) \rangle$	2b, 2c, a	0, 1/2, 0
$Amma$ (63, $Cmcm$)	$\langle 2; 3; 5 \rangle$	2b, 2c, a	
$Amma$ (63, $Cmcm$)	$\langle 2; (3; 5) + (0, 0, 1) \rangle$	2b, 2c, a	0, 0, 1/2
$Amma$ (63, $Cmcm$)	$\langle 5; (2; 3) + (0, 0, 1) \rangle$	2b, 2c, a	0, 1/2, 1/2
$Amma$ (63, $Cmcm$)	$\langle 3; (2; 5) + (0, 0, 1) \rangle$	2b, 2c, a	0, 1/2, 0
[3] $\mathbf{a}' = 3\mathbf{a}$			
$Pmma$ (51)	$\langle 3; 5; 2 + (1, 0, 0) \rangle$	3a, b, c	
$Pmma$ (51)	$\langle 2 + (3, 0, 0); (3; 5) + (2, 0, 0) \rangle$	3a, b, c	1, 0, 0
$Pmma$ (51)	$\langle 2 + (5, 0, 0); (3; 5) + (4, 0, 0) \rangle$	3a, b, c	2, 0, 0
[3] $\mathbf{b}' = 3\mathbf{b}$			
$Pmma$ (51)	$\langle 2; 3; 5 \rangle$	a, 3b, c	
$Pmma$ (51)	$\langle 3; (2; 5) + (0, 2, 0) \rangle$	a, 3b, c	0, 1, 0
$Pmma$ (51)	$\langle 3; (2; 5) + (0, 4, 0) \rangle$	a, 3b, c	0, 2, 0
[3] $\mathbf{c}' = 3\mathbf{c}$			
$Pmma$ (51)	$\langle 2; 3; 5 \rangle$	a, b, 3c	
$Pmma$ (51)	$\langle 2; (3; 5) + (0, 0, 2) \rangle$	a, b, 3c	0, 0, 1
$Pmma$ (51)	$\langle 2; (3; 5) + (0, 0, 4) \rangle$	a, b, 3c	0, 0, 2

(Continued on the facing page)

I Minimal translationengleiche supergroups

[2] *P4/nbm* (125); [2] *P4₂/nbc* (133)

II Minimal non-isomorphic klassengleiche supergroups

• **Additional centring translations**

[2] *Cmmm* (65); [2] *Aaaa* (68, *Ccce*); [2] *Bbeb* (68, *Ccce*); [2] *Ibam* (72)

• **Decreased unit cell**

[2] $\mathbf{a}' = \frac{1}{2}\mathbf{a}$ *Pbmb* (49, *Pccm*); [2] $\mathbf{b}' = \frac{1}{2}\mathbf{b}$ *Pmaa* (49, *Pccm*)

Pmma

No. 51

(Continued from the facing page)

• **Series of maximal isomorphic subgroups**

<p>[<i>p</i>] $\mathbf{a}' = p\mathbf{a}$ <i>Pmma</i> (51)</p>	<p>$\langle 2 + (\frac{p}{2} - \frac{1}{2} + 2u, 0, 0); (3; 5) + (2u, 0, 0) \rangle$ $p > 2; 0 \leq u < p$ <i>p</i> conjugate subgroups for the prime <i>p</i></p>	<p>$p\mathbf{a}, \mathbf{b}, \mathbf{c}$</p>	<p>$u, 0, 0$</p>
<p>[<i>p</i>] $\mathbf{b}' = p\mathbf{b}$ <i>Pmma</i> (51)</p>	<p>$\langle 3; (2; 5) + (0, 2u, 0) \rangle$ $p > 2; 0 \leq u < p$ <i>p</i> conjugate subgroups for the prime <i>p</i></p>	<p>$\mathbf{a}, p\mathbf{b}, \mathbf{c}$</p>	<p>$0, u, 0$</p>
<p>[<i>p</i>] $\mathbf{c}' = p\mathbf{c}$ <i>Pmma</i> (51)</p>	<p>$\langle 2; (3; 5) + (0, 0, 2u) \rangle$ $p > 2; 0 \leq u < p$ <i>p</i> conjugate subgroups for the prime <i>p</i></p>	<p>$\mathbf{a}, \mathbf{b}, p\mathbf{c}$</p>	<p>$0, 0, u$</p>

I Minimal translationengleiche supergroups

none

II Minimal non-isomorphic klassengleiche supergroups

• **Additional centring translations**

[2] *Amma* (63, *Cmcm*); [2] *Bmmm* (65, *Cmmm*); [2] *Cmme* (67); [2] *Imma* (74)

• **Decreased unit cell**

[2] $\mathbf{a}' = \frac{1}{2}\mathbf{a}$ *Pmmm* (47)