

$P\bar{1}$

No. 2

 $P\bar{1}$
 C_i^1
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 i 1

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

 [2] $P1$ (1) 1

II Maximal klassengleiche subgroups

• Enlarged unit cell

[2] $\mathbf{a}' = 2\mathbf{a}$	$P\bar{1}$ (2)	$\langle 2 \rangle$	$2\mathbf{a}, \mathbf{b}, \mathbf{c}$	
	$P\bar{1}$ (2)	$\langle 2 + (1, 0, 0) \rangle$	$2\mathbf{a}, \mathbf{b}, \mathbf{c}$	1/2, 0, 0
[2] $\mathbf{b}' = 2\mathbf{b}$	$P\bar{1}$ (2)	$\langle 2 \rangle$	$\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	
	$P\bar{1}$ (2)	$\langle 2 + (0, 1, 0) \rangle$	$\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	0, 1/2, 0
[2] $\mathbf{c}' = 2\mathbf{c}$	$P\bar{1}$ (2)	$\langle 2 \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
	$P\bar{1}$ (2)	$\langle 2 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	0, 0, 1/2
[2] $\mathbf{b}' = 2\mathbf{b}, \mathbf{c}' = 2\mathbf{c}$	$A\bar{1}$ (2, $P\bar{1}$)	$\langle 2 \rangle$	$\mathbf{a}, 2\mathbf{b}, \mathbf{b} + \mathbf{c}$	
	$A\bar{1}$ (2, $P\bar{1}$)	$\langle 2 + (0, 1, 0) \rangle$	$\mathbf{a}, 2\mathbf{b}, \mathbf{b} + \mathbf{c}$	0, 1/2, 0
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{c}' = 2\mathbf{c}$	$B\bar{1}$ (2, $P\bar{1}$)	$\langle 2 \rangle$	$2\mathbf{a}, \mathbf{b}, \mathbf{a} + \mathbf{c}$	
	$B\bar{1}$ (2, $P\bar{1}$)	$\langle 2 + (1, 0, 0) \rangle$	$2\mathbf{a}, \mathbf{b}, \mathbf{a} + \mathbf{c}$	1/2, 0, 0
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$	$C\bar{1}$ (2, $P\bar{1}$)	$\langle 2 \rangle$	$2\mathbf{a}, \mathbf{a} + \mathbf{b}, \mathbf{c}$	
	$C\bar{1}$ (2, $P\bar{1}$)	$\langle 2 + (1, 0, 0) \rangle$	$2\mathbf{a}, \mathbf{a} + \mathbf{b}, \mathbf{c}$	1/2, 0, 0
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}, \mathbf{c}' = 2\mathbf{c}$	$F\bar{1}$ (2, $P\bar{1}$)	$\langle 2 \rangle$	$2\mathbf{a}, \mathbf{a} + \mathbf{b}, \mathbf{a} + \mathbf{c}$	
	$F\bar{1}$ (2, $P\bar{1}$)	$\langle 2 + (1, 0, 0) \rangle$	$2\mathbf{a}, \mathbf{a} + \mathbf{b}, \mathbf{a} + \mathbf{c}$	1/2, 0, 0
[3] $\mathbf{a}' = 3\mathbf{a}$	$P\bar{1}$ (2)	$\langle 2 \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$	
	$P\bar{1}$ (2)	$\langle 2 + (2, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$	1, 0, 0
	$P\bar{1}$ (2)	$\langle 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$	2, 0, 0
[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = \mathbf{a} + \mathbf{b}$	$P\bar{1}$ (2)	$\langle 2 \rangle$	$3\mathbf{a}, \mathbf{a} + \mathbf{b}, \mathbf{c}$	
	$P\bar{1}$ (2)	$\langle 2 + (2, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{a} + \mathbf{b}, \mathbf{c}$	1, 0, 0
	$P\bar{1}$ (2)	$\langle 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{a} + \mathbf{b}, \mathbf{c}$	2, 0, 0
[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 2\mathbf{a} + \mathbf{b}$	$P\bar{1}$ (2)	$\langle 2 \rangle$	$3\mathbf{a}, 2\mathbf{a} + \mathbf{b}, \mathbf{c}$	
	$P\bar{1}$ (2)	$\langle 2 + (2, 0, 0) \rangle$	$3\mathbf{a}, 2\mathbf{a} + \mathbf{b}, \mathbf{c}$	1, 0, 0
	$P\bar{1}$ (2)	$\langle 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, 2\mathbf{a} + \mathbf{b}, \mathbf{c}$	2, 0, 0
[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{c}' = \mathbf{a} + \mathbf{c}$	$P\bar{1}$ (2)	$\langle 2 \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{a} + \mathbf{c}$	
	$P\bar{1}$ (2)	$\langle 2 + (2, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{a} + \mathbf{c}$	1, 0, 0
	$P\bar{1}$ (2)	$\langle 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{a} + \mathbf{c}$	2, 0, 0
[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{c}' = 2\mathbf{a} + \mathbf{c}$	$P\bar{1}$ (2)	$\langle 2 \rangle$	$3\mathbf{a}, \mathbf{b}, 2\mathbf{a} + \mathbf{c}$	
	$P\bar{1}$ (2)	$\langle 2 + (2, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, 2\mathbf{a} + \mathbf{c}$	1, 0, 0
	$P\bar{1}$ (2)	$\langle 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, 2\mathbf{a} + \mathbf{c}$	2, 0, 0
[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = \mathbf{a} + \mathbf{b}, \mathbf{c}' = \mathbf{a} + \mathbf{c}$	$P\bar{1}$ (2)	$\langle 2 \rangle$	$3\mathbf{a}, \mathbf{a} + \mathbf{b}, \mathbf{a} + \mathbf{c}$	
	$P\bar{1}$ (2)	$\langle 2 + (2, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{a} + \mathbf{b}, \mathbf{a} + \mathbf{c}$	1, 0, 0
	$P\bar{1}$ (2)	$\langle 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{a} + \mathbf{b}, \mathbf{a} + \mathbf{c}$	2, 0, 0
[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 2\mathbf{a} + \mathbf{b}, \mathbf{c}' = \mathbf{a} + \mathbf{c}$	$P\bar{1}$ (2)	$\langle 2 \rangle$	$3\mathbf{a}, 2\mathbf{a} + \mathbf{b}, \mathbf{a} + \mathbf{c}$	
	$P\bar{1}$ (2)	$\langle 2 + (2, 0, 0) \rangle$	$3\mathbf{a}, 2\mathbf{a} + \mathbf{b}, \mathbf{a} + \mathbf{c}$	1, 0, 0
	$P\bar{1}$ (2)	$\langle 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, 2\mathbf{a} + \mathbf{b}, \mathbf{a} + \mathbf{c}$	2, 0, 0

[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = \mathbf{a} + \mathbf{b}, \mathbf{c}' = 2\mathbf{a} + \mathbf{c}$			
$\left\{ \begin{array}{l} P\bar{1} (2) \\ P\bar{1} (2) \\ P\bar{1} (2) \end{array} \right.$	$\langle 2 \rangle$ $\langle 2 + (2, 0, 0) \rangle$ $\langle 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{a} + \mathbf{b}, 2\mathbf{a} + \mathbf{c}$ $3\mathbf{a}, \mathbf{a} + \mathbf{b}, 2\mathbf{a} + \mathbf{c}$ $3\mathbf{a}, \mathbf{a} + \mathbf{b}, 2\mathbf{a} + \mathbf{c}$	 $1, 0, 0$ $2, 0, 0$
[3] $\mathbf{a}' = 3\mathbf{a}, \mathbf{b}' = 2\mathbf{a} + \mathbf{b}, \mathbf{c}' = 2\mathbf{a} + \mathbf{c}$			
$\left\{ \begin{array}{l} P\bar{1} (2) \\ P\bar{1} (2) \\ P\bar{1} (2) \end{array} \right.$	$\langle 2 \rangle$ $\langle 2 + (2, 0, 0) \rangle$ $\langle 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, 2\mathbf{a} + \mathbf{b}, 2\mathbf{a} + \mathbf{c}$ $3\mathbf{a}, 2\mathbf{a} + \mathbf{b}, 2\mathbf{a} + \mathbf{c}$ $3\mathbf{a}, 2\mathbf{a} + \mathbf{b}, 2\mathbf{a} + \mathbf{c}$	 $1, 0, 0$ $2, 0, 0$
[3] $\mathbf{b}' = 3\mathbf{b}$			
$\left\{ \begin{array}{l} P\bar{1} (2) \\ P\bar{1} (2) \\ P\bar{1} (2) \end{array} \right.$	$\langle 2 \rangle$ $\langle 2 + (0, 2, 0) \rangle$ $\langle 2 + (0, 4, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	 $0, 1, 0$ $0, 2, 0$
[3] $\mathbf{b}' = 3\mathbf{b}, \mathbf{c}' = \mathbf{b} + \mathbf{c}$			
$\left\{ \begin{array}{l} P\bar{1} (2) \\ P\bar{1} (2) \\ P\bar{1} (2) \end{array} \right.$	$\langle 2 \rangle$ $\langle 2 + (0, 2, 0) \rangle$ $\langle 2 + (0, 4, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{b} + \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{b} + \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{b} + \mathbf{c}$	 $0, 1, 0$ $0, 2, 0$
[3] $\mathbf{b}' = 3\mathbf{b}, \mathbf{c}' = 2\mathbf{b} + \mathbf{c}$			
$\left\{ \begin{array}{l} P\bar{1} (2) \\ P\bar{1} (2) \\ P\bar{1} (2) \end{array} \right.$	$\langle 2 \rangle$ $\langle 2 + (0, 2, 0) \rangle$ $\langle 2 + (0, 4, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, 2\mathbf{b} + \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, 2\mathbf{b} + \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, 2\mathbf{b} + \mathbf{c}$	 $0, 1, 0$ $0, 2, 0$
[3] $\mathbf{c}' = 3\mathbf{c}$			
$\left\{ \begin{array}{l} P\bar{1} (2) \\ P\bar{1} (2) \\ P\bar{1} (2) \end{array} \right.$	$\langle 2 \rangle$ $\langle 2 + (0, 0, 2) \rangle$ $\langle 2 + (0, 0, 4) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$ $\mathbf{a}, \mathbf{b}, 3\mathbf{c}$ $\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	 $0, 0, 1$ $0, 0, 2$

• Series of maximal isomorphic subgroups

[p] $\mathbf{a}' = p\mathbf{a}, \mathbf{b}' = q\mathbf{a} + \mathbf{b}, \mathbf{c}' = r\mathbf{a} + \mathbf{c}$			
$P\bar{1} (2)$	$\langle 2 + (2u, 0, 0) \rangle$ $p > 2; 0 \leq q < p; 0 \leq r < p; 0 \leq u < p$ p conjugate subgroups for each triplet of $q, r,$ and prime p	$p\mathbf{a}, q\mathbf{a} + \mathbf{b}, r\mathbf{a} + \mathbf{c}$	$u, 0, 0$
[p] $\mathbf{b}' = p\mathbf{b}, \mathbf{c}' = q\mathbf{b} + \mathbf{c}$			
$P\bar{1} (2)$	$\langle 2 + (0, 2u, 0) \rangle$ $p > 2; 0 \leq q < p; 0 \leq u < p$ p conjugate subgroups for each pair of q and prime p	$\mathbf{a}, p\mathbf{b}, q\mathbf{b} + \mathbf{c}$	$0, u, 0$
[p] $\mathbf{c}' = p\mathbf{c}$			
$P\bar{1} (2)$	$\langle 2 + (0, 0, 2u) \rangle$ $p > 2; 0 \leq u < p$ p conjugate subgroups for the prime p	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	$0, 0, u$

I Minimal *translationengleiche* supergroups

[2] $P12/m1$ (10); [2] $P112/m$ (10); [2] $P12_1/m1$ (11); [2] $P112_1/m$ (11); [2] $C12/m1$ (12); [2] $A112/m$ (12); [2] $P12/c1$ (13); [2] $P112/a$ (13); [2] $P12_1/c1$ (14); [2] $P112_1/a$ (14); [2] $C12/c1$ (15); [2] $A112/a$ (15); [3] $P\bar{3}$ (147); [3] $R\bar{3}$ (148)

II Minimal non-isomorphic *klassengleiche* supergroups

none