

$Pcc2$

No. 27

 $Pcc2$
 C_{2v}^3
Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (3)

General position

 Multiplicity,
 Wyckoff letter,
 Site symmetry

Coordinates

 4 e 1 (1) x, y, z (2) \bar{x}, \bar{y}, z (3) $x, \bar{y}, z + \frac{1}{2}$ (4) $\bar{x}, y, z + \frac{1}{2}$
I Maximal translationengleiche subgroups

[2] $P1c1$ (7)	1; 3	
[2] $Pc11$ (7, $P1c1$)	1; 4	$-\mathbf{b}, \mathbf{a}, \mathbf{c}$
[2] $P112$ (3)	1; 2	

II Maximal klassengleiche subgroups

• Enlarged unit cell

[2] $\mathbf{a}' = 2\mathbf{a}$			
$Pcn2$ (30, $Pnc2$)	$\langle 2; 3 + (1, 0, 0) \rangle$	$-\mathbf{b}, 2\mathbf{a}, \mathbf{c}$	
$Pcn2$ (30, $Pnc2$)	$\langle (2; 3) + (1, 0, 0) \rangle$	$-\mathbf{b}, 2\mathbf{a}, \mathbf{c}$	$1/2, 0, 0$
$Pcc2$ (27)	$\langle 2; 3 \rangle$	$2\mathbf{a}, \mathbf{b}, \mathbf{c}$	
$Pcc2$ (27)	$\langle 3; 2 + (1, 0, 0) \rangle$	$2\mathbf{a}, \mathbf{b}, \mathbf{c}$	$1/2, 0, 0$
[2] $\mathbf{b}' = 2\mathbf{b}$			
$Pnc2$ (30)	$\langle 2; 3 + (0, 1, 0) \rangle$	$\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	
$Pnc2$ (30)	$\langle 3; 2 + (0, 1, 0) \rangle$	$\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	$0, 1/2, 0$
$Pcc2$ (27)	$\langle 2; 3 \rangle$	$\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	
$Pcc2$ (27)	$\langle (2; 3) + (0, 1, 0) \rangle$	$\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	$0, 1/2, 0$
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$			
$Ccc2$ (37)	$\langle 2; 3 \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	
$Ccc2$ (37)	$\langle 3; 2 + (1, 0, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	$1/2, 0, 0$
$Ccc2$ (37)	$\langle (2; 3) + (0, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	$0, 1/2, 0$
$Ccc2$ (37)	$\langle 2 + (1, 1, 0); 3 + (0, 1, 0) \rangle$	$2\mathbf{a}, 2\mathbf{b}, \mathbf{c}$	$1/2, 1/2, 0$
[3] $\mathbf{a}' = 3\mathbf{a}$			
$Pcc2$ (27)	$\langle 2; 3 \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$	
$Pcc2$ (27)	$\langle 3; 2 + (2, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$	$1, 0, 0$
$Pcc2$ (27)	$\langle 3; 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$	$2, 0, 0$
[3] $\mathbf{b}' = 3\mathbf{b}$			
$Pcc2$ (27)	$\langle 2; 3 \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	
$Pcc2$ (27)	$\langle (2; 3) + (0, 2, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	$0, 1, 0$
$Pcc2$ (27)	$\langle (2; 3) + (0, 4, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	$0, 2, 0$
[3] $\mathbf{c}' = 3\mathbf{c}$			
$Pcc2$ (27)	$\langle 2; 3 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	

• Series of maximal isomorphic subgroups

[p] $\mathbf{a}' = p\mathbf{a}$			
$Pcc2$ (27)	$\langle 3; 2 + (2u, 0, 0) \rangle$	$p\mathbf{a}, \mathbf{b}, \mathbf{c}$	$u, 0, 0$
	$p > 2; 0 \leq u < p$		
	p conjugate subgroups for the prime p		
[p] $\mathbf{b}' = p\mathbf{b}$			
$Pcc2$ (27)	$\langle (2; 3) + (0, 2u, 0) \rangle$	$\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$0, u, 0$
	$p > 2; 0 \leq u < p$		
	p conjugate subgroups for the prime p		
[p] $\mathbf{c}' = p\mathbf{c}$			
$Pcc2$ (27)	$\langle 2; 3 + (0, 0, \frac{p}{2} - \frac{1}{2}) \rangle$	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	
	$p > 2$		
	no conjugate subgroups		

I Minimal translationengleiche supergroups

 [2] $Pccm$ (49); [2] $Pcca$ (54); [2] $Pccn$ (56); [2] $P4_2cm$ (101); [2] $P4cc$ (103); [2] $P\bar{4}c2$ (116)

II Minimal non-isomorphic klassengleiche supergroups

• Additional centring translations

 [2] $Ccc2$ (37); [2] $Aem2$ (39); [2] $Bme2$ (39, $Aem2$); [2] $Iba2$ (45)

• Decreased unit cell

 [2] $\mathbf{c}' = \frac{1}{2}\mathbf{c}$ $Pmm2$ (25)