

$Pcc2$

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	–b, a, c
[2] $P112$ (3)	1; 2	

II Maximal *klassengleiche* subgroups

• Enlarged unit cell

[2] $\mathbf{a}' = 2\mathbf{a}$			
$Pcn2$ (30, $Pnc2$)	$\langle 2; 3 + (1, 0, 0) \rangle$	–b, 2a, c	
$Pcn2$ (30, $Pnc2$)	$\langle (2; 3) + (1, 0, 0) \rangle$	–b, 2a, c	1/2, 0, 0
$Pcc2$ (27)	$\langle 2; 3 \rangle$	2a, b, c	
$Pcc2$ (27)	$\langle 3; 2 + (1, 0, 0) \rangle$	2a, b, c	1/2, 0, 0
[2] $\mathbf{b}' = 2\mathbf{b}$			
$Pnc2$ (30)	$\langle 2; 3 + (0, 1, 0) \rangle$	a, 2b, c	
$Pnc2$ (30)	$\langle 3; 2 + (0, 1, 0) \rangle$	a, 2b, c	0, 1/2, 0
$Pcc2$ (27)	$\langle 2; 3 \rangle$	a, 2b, c	
$Pcc2$ (27)	$\langle (2; 3) + (0, 1, 0) \rangle$	a, 2b, c	0, 1/2, 0
[2] $\mathbf{a}' = 2\mathbf{a}, \mathbf{b}' = 2\mathbf{b}$			
$Ccc2$ (37)	$\langle 2; 3 \rangle$	2a, 2b, c	
$Ccc2$ (37)	$\langle 3; 2 + (1, 0, 0) \rangle$	2a, 2b, c	1/2, 0, 0
$Ccc2$ (37)	$\langle (2; 3) + (0, 1, 0) \rangle$	2a, 2b, c	0, 1/2, 0
$Ccc2$ (37)	$\langle 2 + (1, 1, 0); 3 + (0, 1, 0) \rangle$	2a, 2b, c	1/2, 1/2, 0
[3] $\mathbf{a}' = 3\mathbf{a}$			
$Pcc2$ (27)	$\langle 2; 3 \rangle$	3a, b, c	
$Pcc2$ (27)	$\langle 3; 2 + (2, 0, 0) \rangle$	3a, b, c	1, 0, 0
$Pcc2$ (27)	$\langle 3; 2 + (4, 0, 0) \rangle$	3a, b, c	2, 0, 0
[3] $\mathbf{b}' = 3\mathbf{b}$			
$Pcc2$ (27)	$\langle 2; 3 \rangle$	a, 3b, c	
$Pcc2$ (27)	$\langle (2; 3) + (0, 2, 0) \rangle$	a, 3b, c	0, 1, 0
$Pcc2$ (27)	$\langle (2; 3) + (0, 4, 0) \rangle$	a, 3b, c	0, 2, 0
[3] $\mathbf{c}' = 3\mathbf{c}$			
$Pcc2$ (27)	$\langle 2; 3 + (0, 0, 1) \rangle$	a, b, 3c	
• Series of maximal isomorphic subgroups			
[p] $\mathbf{a}' = p\mathbf{a}$			
$Pcc2$ (27)	$\langle 3; 2 + (2u, 0, 0) \rangle$ prime $p > 2$; $0 \leq u < p$ p conjugate subgroups	$p\mathbf{a}, \mathbf{b}, \mathbf{c}$	$u, 0, 0$
[p] $\mathbf{b}' = p\mathbf{b}$			
$Pcc2$ (27)	$\langle (2; 3) + (0, 2u, 0) \rangle$ prime $p > 2$; $0 \leq u < p$ p conjugate subgroups	$\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$0, u, 0$
[p] $\mathbf{c}' = p\mathbf{c}$			
$Pcc2$ (27)	$\langle 2; 3 + (0, 0, \frac{p}{2} - \frac{1}{2}) \rangle$ prime $p > 2$ no conjugate subgroups	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	

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)