

$Cmm2$ 

No. 35

 $Cmm2$  $C_{2v}^{11}$ Generators selected (1);  $t(1,0,0)$ ;  $t(0,1,0)$ ;  $t(0,0,1)$ ;  $t(\frac{1}{2},\frac{1}{2},0)$ ; (2); (3)

## General position

Multiplicity,  
Wyckoff letter,  
Site symmetry

## Coordinates

 $(0,0,0)+$   $(\frac{1}{2},\frac{1}{2},0)+$ 8  $f$  1(1)  $x,y,z$  (2)  $\bar{x},\bar{y},z$  (3)  $x,\bar{y},z$  (4)  $\bar{x},y,z$ 

## I Maximal translationengleiche subgroups

[2] $C1m1$ (8)	(1; 3)+		
[2] $Cm11$ (8, $C1m1$ )	(1; 4)+	$-\mathbf{b}, \mathbf{a}, \mathbf{c}$	
[2] $C112$ (3, $P112$ )	(1; 2)+	$1/2(\mathbf{a}-\mathbf{b}), 1/2(\mathbf{a}+\mathbf{b}), \mathbf{c}$	

## II Maximal klassengleiche subgroups

## • Loss of centring translations

[2] $Pba2$ (32)	$1; 2; (3; 4) + (\frac{1}{2}, \frac{1}{2}, 0)$		
[2] $Pbm2$ (28, $Pma2$ )	$1; 3; (2; 4) + (\frac{1}{2}, \frac{1}{2}, 0)$	$-\mathbf{b}, \mathbf{a}, \mathbf{c}$	$1/4, 1/4, 0$
[2] $Pma2$ (28)	$1; 4; (2; 3) + (\frac{1}{2}, \frac{1}{2}, 0)$		$1/4, 1/4, 0$
[2] $Pmm2$ (25)	$1; 2; 3; 4$		

## • Enlarged unit cell

[2] $\mathbf{c}' = 2\mathbf{c}$			
$Ima2$ (46)	$\langle (2; 3) + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	$1/4, 1/4, 0$
$Ibm2$ (46, $Ima2$ )	$\langle 3; 2 + (0, 0, 1) \rangle$	$-\mathbf{b}, \mathbf{a}, 2\mathbf{c}$	$1/4, 1/4, 0$
$Iba2$ (45)	$\langle 2; 3 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
$Imm2$ (44)	$\langle 2; 3 \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
$Ccc2$ (37)	$\langle 2; 3 + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
$Cmc2_1$ (36)	$\langle (2; 3) + (0, 0, 1) \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
$Ccm2_1$ (36, $Cmc2_1$ )	$\langle 3; 2 + (0, 0, 1) \rangle$	$-\mathbf{b}, \mathbf{a}, 2\mathbf{c}$	
$Cmm2$ (35)	$\langle 2; 3 \rangle$	$\mathbf{a}, \mathbf{b}, 2\mathbf{c}$	
[3] $\mathbf{a}' = 3\mathbf{a}$			
$Cmm2$ (35)	$\langle 2; 3 \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$	
$Cmm2$ (35)	$\langle 3; 2 + (2, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$	$1, 0, 0$
$Cmm2$ (35)	$\langle 3; 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$	$2, 0, 0$
[3] $\mathbf{b}' = 3\mathbf{b}$			
$Cmm2$ (35)	$\langle 2; 3 \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	
$Cmm2$ (35)	$\langle (2; 3) + (0, 2, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	$0, 1, 0$
$Cmm2$ (35)	$\langle (2; 3) + (0, 4, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	$0, 2, 0$
[3] $\mathbf{c}' = 3\mathbf{c}$			
$Cmm2$ (35)	$\langle 2; 3 \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	

## • Series of maximal isomorphic subgroups

[ $p$ ] $\mathbf{a}' = p\mathbf{a}$			
$Cmm2$ (35)	$\langle 3; 2 + (2u, 0, 0) \rangle$ prime $p > 2$ ; $0 \leq u < p$ $p$ conjugate subgroups	$p\mathbf{a}, \mathbf{b}, \mathbf{c}$	$u, 0, 0$
[ $p$ ] $\mathbf{b}' = p\mathbf{b}$			
$Cmm2$ (35)	$\langle (2; 3) + (0, 2u, 0) \rangle$ prime $p > 2$ ; $0 \leq u < p$ $p$ conjugate subgroups	$\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$0, u, 0$
[ $p$ ] $\mathbf{c}' = p\mathbf{c}$			
$Cmm2$ (35)	$\langle 2; 3 \rangle$ $p$ prime no conjugate subgroups	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	

## I Minimal translationengleiche supergroups

[2]  $Cmmm$  (65); [2]  $Cmme$  (67); [2]  $P4mm$  (99); [2]  $P4bm$  (100); [2]  $P4_2cm$  (101); [2]  $P4_2nm$  (102); [2]  $P\bar{4}2m$  (111); [2]  $P\bar{4}2_1m$  (113); [3]  $P6mm$  (183)

## II Minimal non-isomorphic klassengleiche supergroups

## • Additional centring translations

[2]  $Fmm2$  (42)

## • Decreased unit cell

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