

$Imm2$ 

No. 44

 $Imm2$ 
 $C_{2v}^{20}$ 
**Generators selected** (1);  $t(1,0,0)$ ;  $t(0,1,0)$ ;  $t(0,0,1)$ ;  $t(\frac{1}{2},\frac{1}{2},\frac{1}{2})$ ; (2); (3)

**General position**

 Multiplicity,  
Wyckoff letter,  
Site symmetry

**Coordinates**

 8  $e$  1

 $(0,0,0)+$   $(\frac{1}{2},\frac{1}{2},\frac{1}{2})+$ 

 (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] $I1m1$ (8, $C1m1$ )	$\langle 1; 3 \rangle +$	$-\mathbf{a} - \mathbf{c}, \mathbf{b}, \mathbf{a}$
[2] $Im11$ (8, $C1m1$ )	$\langle 1; 4 \rangle +$	$-\mathbf{b} - \mathbf{c}, \mathbf{a}, \mathbf{c}$
[2] $I112$ (5, $A112$ )	$\langle 1; 2 \rangle +$	$\mathbf{b}, -\mathbf{a} - \mathbf{b}, \mathbf{c}$

**II Maximal klassengleiche subgroups**

## • Loss of centring translations

[2] $Pnn2$ (34)	$1; 2; (3; 4) + (\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$		
[2] $Pnm2_1$ (31, $Pmn2_1$ )	$1; 3; (2; 4) + (\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$	$-\mathbf{b}, \mathbf{a}, \mathbf{c}$	$1/4, 0, 0$
[2] $Pmm2_1$ (31)	$1; 4; (2; 3) + (\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$		$0, 1/4, 0$
[2] $Pmm2$ (25)	$1; 2; 3; 4$		

## • Enlarged unit cell

[3] $\mathbf{a}' = 3\mathbf{a}$			
$\left\{ \begin{array}{l} Imm2 (44) \\ Imm2 (44) \\ Imm2 (44) \end{array} \right.$	$\langle 2; 3 \rangle$ $\langle 3; 2 + (2, 0, 0) \rangle$ $\langle 3; 2 + (4, 0, 0) \rangle$	$3\mathbf{a}, \mathbf{b}, \mathbf{c}$ $3\mathbf{a}, \mathbf{b}, \mathbf{c}$ $3\mathbf{a}, \mathbf{b}, \mathbf{c}$	$1, 0, 0$ $2, 0, 0$
[3] $\mathbf{b}' = 3\mathbf{b}$			
$\left\{ \begin{array}{l} Imm2 (44) \\ Imm2 (44) \\ Imm2 (44) \end{array} \right.$	$\langle 2; 3 \rangle$ $\langle (2; 3) + (0, 2, 0) \rangle$ $\langle (2; 3) + (0, 4, 0) \rangle$	$\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$ $\mathbf{a}, 3\mathbf{b}, \mathbf{c}$	$0, 1, 0$ $0, 2, 0$
[3] $\mathbf{c}' = 3\mathbf{c}$			
$Imm2 (44)$	$\langle 2; 3 \rangle$	$\mathbf{a}, \mathbf{b}, 3\mathbf{c}$	

## • Series of maximal isomorphic subgroups

[ $p$ ] $\mathbf{a}' = p\mathbf{a}$			
$Imm2 (44)$	$\langle 3; 2 + (2u, 0, 0) \rangle$ $p > 2; 0 \leq u < p$ $p$ conjugate subgroups for the prime $p$	$p\mathbf{a}, \mathbf{b}, \mathbf{c}$	$u, 0, 0$
[ $p$ ] $\mathbf{b}' = p\mathbf{b}$			
$Imm2 (44)$	$\langle (2; 3) + (0, 2u, 0) \rangle$ $p > 2; 0 \leq u < p$ $p$ conjugate subgroups for the prime $p$	$\mathbf{a}, p\mathbf{b}, \mathbf{c}$	$0, u, 0$
[ $p$ ] $\mathbf{c}' = p\mathbf{c}$			
$Imm2 (44)$	$\langle 2; 3 \rangle$ $p > 2$ no conjugate subgroups	$\mathbf{a}, \mathbf{b}, p\mathbf{c}$	

**I Minimal translationengleiche supergroups**

 [2]  $Immm$  (71); [2]  $Imma$  (74); [2]  $I4mm$  (107); [2]  $I4_1md$  (109); [2]  $I\bar{4}m2$  (119)

**II Minimal non-isomorphic klassengleiche supergroups**

## • Additional centring translations

none

## • Decreased unit cell

 [2]  $\mathbf{c}' = \frac{1}{2}\mathbf{c}$   $Cmm2$  (35); [2]  $\mathbf{a}' = \frac{1}{2}\mathbf{a}$   $Amm2$  (38); [2]  $\mathbf{b}' = \frac{1}{2}\mathbf{b}$   $Bmm2$  (38,  $Amm2$ )