| $C_{2v}^2$ | $Pmc2_1$ | No. 26 | $Pmc2_1$ |
|---|---|---|---|

**Generators selected**   (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (3)

**General position**

Multiplicity,
Wyckoff letter,                                    Coordinates
Site symmetry

| 4 | $c$ | 1 | | (1) $x,y,z$ | (2) $\bar{x},\bar{y},z+\frac{1}{2}$ | (3) $x,\bar{y},z+\frac{1}{2}$ | (4) $\bar{x},y,z$ |
|---|---|---|---|---|---|---|---|

**I Maximal *translationengleiche* subgroups**

| | | |
|---|---|---|
| [2] $P1c1$  (7) | 1; 3 | |
| [2] $Pm11$  (6, $P1m1$) | 1; 4 | $\mathbf{c},\mathbf{a},\mathbf{b}$ |
| [2] $P112_1$  (4) | 1; 2 | |

**II Maximal *klassengleiche* subgroups**

● **Enlarged unit cell**

[2] $\mathbf{a}' = 2\mathbf{a}$

| | | | |
|---|---|---|---|
| $Pmn2_1$  (31) | $\langle 2;\ 3+(1,0,0)\rangle$ | $2\mathbf{a},\mathbf{b},\mathbf{c}$ | $1/2,0,0$ |
| $Pmn2_1$  (31) | $\langle (2;\ 3)+(1,0,0)\rangle$ | $2\mathbf{a},\mathbf{b},\mathbf{c}$ | |
| $Pmc2_1$  (26) | $\langle 2;\ 3\rangle$ | $2\mathbf{a},\mathbf{b},\mathbf{c}$ | |
| $Pmc2_1$  (26) | $\langle 3;\ 2+(1,0,0)\rangle$ | $2\mathbf{a},\mathbf{b},\mathbf{c}$ | $1/2,0,0$ |

[2] $\mathbf{b}' = 2\mathbf{b}$

| | | | |
|---|---|---|---|
| $Pbc2_1$  (29, $Pca2_1$) | $\langle 2;\ 3+(0,1,0)\rangle$ | $-2\mathbf{b},\mathbf{a},\mathbf{c}$ | |
| $Pbc2_1$  (29, $Pca2_1$) | $\langle 3;\ 2+(0,1,0)\rangle$ | $-2\mathbf{b},\mathbf{a},\mathbf{c}$ | $0,1/2,0$ |
| $Pmc2_1$  (26) | $\langle 2;\ 3\rangle$ | $\mathbf{a},2\mathbf{b},\mathbf{c}$ | |
| $Pmc2_1$  (26) | $\langle (2;\ 3)+(0,1,0)\rangle$ | $\mathbf{a},2\mathbf{b},\mathbf{c}$ | $0,1/2,0$ |

[2] $\mathbf{a}' = 2\mathbf{a}$, $\mathbf{b}' = 2\mathbf{b}$

| | | | |
|---|---|---|---|
| $Cmc2_1$  (36) | $\langle 2;\ 3\rangle$ | $2\mathbf{a},2\mathbf{b},\mathbf{c}$ | |
| $Cmc2_1$  (36) | $\langle 3;\ 2+(1,0,0)\rangle$ | $2\mathbf{a},2\mathbf{b},\mathbf{c}$ | $1/2,0,0$ |
| $Cmc2_1$  (36) | $\langle (2;\ 3)+(0,1,0)\rangle$ | $2\mathbf{a},2\mathbf{b},\mathbf{c}$ | $0,1/2,0$ |
| $Cmc2_1$  (36) | $\langle 2+(1,1,0);\ 3+(0,1,0)\rangle$ | $2\mathbf{a},2\mathbf{b},\mathbf{c}$ | $1/2,1/2,0$ |

[3] $\mathbf{a}' = 3\mathbf{a}$

| | | | |
|---|---|---|---|
| ⎧ $Pmc2_1$  (26) | $\langle 2;\ 3\rangle$ | $3\mathbf{a},\mathbf{b},\mathbf{c}$ | |
| ⎨ $Pmc2_1$  (26) | $\langle 3;\ 2+(2,0,0)\rangle$ | $3\mathbf{a},\mathbf{b},\mathbf{c}$ | $1,0,0$ |
| ⎩ $Pmc2_1$  (26) | $\langle 3;\ 2+(4,0,0)\rangle$ | $3\mathbf{a},\mathbf{b},\mathbf{c}$ | $2,0,0$ |

[3] $\mathbf{b}' = 3\mathbf{b}$

| | | | |
|---|---|---|---|
| ⎧ $Pmc2_1$  (26) | $\langle 2;\ 3\rangle$ | $\mathbf{a},3\mathbf{b},\mathbf{c}$ | |
| ⎨ $Pmc2_1$  (26) | $\langle (2;\ 3)+(0,2,0)\rangle$ | $\mathbf{a},3\mathbf{b},\mathbf{c}$ | $0,1,0$ |
| ⎩ $Pmc2_1$  (26) | $\langle (2;\ 3)+(0,4,0)\rangle$ | $\mathbf{a},3\mathbf{b},\mathbf{c}$ | $0,2,0$ |

[3] $\mathbf{c}' = 3\mathbf{c}$

| | | | |
|---|---|---|---|
| $Pmc2_1$  (26) | $\langle (2;\ 3)+(0,0,1)\rangle$ | $\mathbf{a},\mathbf{b},3\mathbf{c}$ | |

● **Series of maximal isomorphic subgroups**

[p] $\mathbf{a}' = p\mathbf{a}$

| | | | |
|---|---|---|---|
| $Pmc2_1$  (26) | $\langle 3;\ 2+(2u,0,0)\rangle$ | $p\mathbf{a},\mathbf{b},\mathbf{c}$ | $u,0,0$ |
| | $p > 2;\ 0 \le u < p$ | | |
| | $p$ conjugate subgroups for the prime $p$ | | |

[p] $\mathbf{b}' = p\mathbf{b}$

| | | | |
|---|---|---|---|
| $Pmc2_1$  (26) | $\langle (2;\ 3)+(0,2u,0)\rangle$ | $\mathbf{a},p\mathbf{b},\mathbf{c}$ | $0,u,0$ |
| | $p > 2;\ 0 \le u < p$ | | |
| | $p$ conjugate subgroups for the prime $p$ | | |

[p] $\mathbf{c}' = p\mathbf{c}$

| | | | |
|---|---|---|---|
| $Pmc2_1$  (26) | $\langle (2;\ 3)+(0,0,\frac{p}{2}-\frac{1}{2})\rangle$ | $\mathbf{a},\mathbf{b},p\mathbf{c}$ | |
| | $p > 2$ | | |
| | no conjugate subgroups | | |

**I Minimal *translationengleiche* supergroups**

[2] $Pmma$ (51); [2] $Pbam$ (55); [2] $Pbcm$ (57); [2] $Pnma$ (62)

**II Minimal non-isomorphic *klassengleiche* supergroups**

● **Additional centring translations**

[2] $Cmc2_1$ (36); [2] $Amm2$ (38); [2] $Bme2$ (39, $Aem2$); [2] $Ima2$ (46)

● **Decreased unit cell**

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