

Orthorhombic

6. SCANNING TABLES

 Laue class  $D_{2h} - mmm$ 

 No. 23  $I222$ 

$$\mathcal{G} = I222$$

 $D_2^8$ 

| Orientation orbit<br>( <i>hkl</i> ) | Conventional basis<br>of the scanning group |               |              | Scanning<br>group<br>$\mathcal{H}$ | Linear<br>orbit<br>$s\mathbf{d}$                     | Sectional<br>layer group<br>$\mathcal{L}(s\mathbf{d})$ |     |
|-------------------------------------|---|---------------|--------------|------------------------------------|--|--|-----|
|                                     | $\mathbf{a}'$                               | $\mathbf{b}'$ | $\mathbf{d}$ |                                    |  |  |     |
| (001)                               | $\mathbf{a}$                                | $\mathbf{b}$  | $\mathbf{c}$ | $I222$                             | $[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$               | $p222$   | L19 |
| (100)                               | $\mathbf{b}$                                | $\mathbf{c}$  | $\mathbf{a}$ |                                    | $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$     | $p2_12_12$   | L21 |
| (010)                               | $\mathbf{c}$                                | $\mathbf{a}$  | $\mathbf{b}$ |                                    | $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$ | $p112$   | L03 |

 No. 24  $I2_12_12_1$ 

$$\mathcal{G} = I2_12_12_1$$

 $D_2^9$ 

| Orientation orbit<br>( <i>hkl</i> ) | Conventional basis<br>of the scanning group |               |              | Scanning<br>group<br>$\mathcal{H}$ | Linear<br>orbit<br>$s\mathbf{d}$                     | Sectional<br>layer group<br>$\mathcal{L}(s\mathbf{d})$ |     |
|-------------------------------------|---|---------------|--------------|------------------------------------|--|--|-----|
|                                     | $\mathbf{a}'$                               | $\mathbf{b}'$ | $\mathbf{d}$ |                                    |  |  |     |
| (001)                               | $\mathbf{a}$                                | $\mathbf{b}$  | $\mathbf{c}$ | $I2_12_12_1$                       | $[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$               | $p2_122 (\mathbf{b}'/4)$                               | L20 |
| (100)                               | $\mathbf{b}$                                | $\mathbf{c}$  | $\mathbf{a}$ |                                    | $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$     | $p22_12 (\mathbf{b}'/4)$                               | L20 |
| (010)                               | $\mathbf{c}$                                | $\mathbf{a}$  | $\mathbf{b}$ |                                    | $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$ | $p112 (\mathbf{b}'/4)$                                 | L03 |

**Geometric class  $C_{2v} - mm2$** 

 No. 25  $Pmm2$ 

$$\mathcal{G} = Pmm2$$

 $C_{2v}^1$ 

| Orientation orbit<br>( <i>hkl</i> ) | Conventional basis<br>of the scanning group |               |              | Scanning<br>group<br>$\mathcal{H}$ | Linear<br>orbit<br>$s\mathbf{d}$                                      | Sectional<br>layer group<br>$\mathcal{L}(s\mathbf{d})$ |            |
|-------------------------------------|---|---------------|--------------|------------------------------------|---|--|------------|
|                                     | $\mathbf{a}'$                               | $\mathbf{b}'$ | $\mathbf{d}$ |                                    |   |  |            |
| (001)                               | $\mathbf{a}$                                | $\mathbf{b}$  | $\mathbf{c}$ | $Pmm2$                             | $s\mathbf{d}$   | $pmm2$   | L23        |
| (100)                               | $\mathbf{b}$                                | $\mathbf{c}$  | $\mathbf{a}$ | $Pm2m$                             | $0\mathbf{d}, \frac{1}{2}\mathbf{d}$<br>$[s\mathbf{d}, -s\mathbf{d}]$ | $pm2m$<br>$pm11$                                       | L27<br>L11 |
| (010)                               | $\mathbf{c}$                                | $\mathbf{a}$  | $\mathbf{b}$ | $P2mm$                             | $0\mathbf{d}, \frac{1}{2}\mathbf{d}$<br>$[s\mathbf{d}, -s\mathbf{d}]$ | $p2mm$<br>$p1m1$                                       | L27<br>L11 |

 No. 26  $Pmc2_1$ 

$$\mathcal{G} = Pmc2_1$$

 $C_{2v}^2$ 

| Orientation orbit<br>( <i>hkl</i> ) | Conventional basis<br>of the scanning group |               |              | Scanning<br>group<br>$\mathcal{H}$ | Linear<br>orbit<br>$s\mathbf{d}$                                      | Sectional<br>layer group<br>$\mathcal{L}(s\mathbf{d})$ |            |
|-------------------------------------|---|---------------|--------------|------------------------------------|---|--|------------|
|                                     | $\mathbf{a}'$                               | $\mathbf{b}'$ | $\mathbf{d}$ |                                    |   |  |            |
| (001)                               | $\mathbf{a}$                                | $\mathbf{b}$  | $\mathbf{c}$ | $Pmc2_1$                           | $[s\mathbf{d}, (s + \frac{1}{2})\mathbf{d}]$                          | $pm11$   | L11        |
| (100)                               | $\mathbf{b}$                                | $\mathbf{c}$  | $\mathbf{a}$ | $Pb2_1m$                           | $0\mathbf{d}, \frac{1}{2}\mathbf{d}$<br>$[s\mathbf{d}, -s\mathbf{d}]$ | $pb2_1m$<br>$pb11$                                     | L29<br>L12 |
| (010)                               | $\mathbf{c}$                                | $\mathbf{a}$  | $\mathbf{b}$ | $P2_1ma$                           | $0\mathbf{d}, \frac{1}{2}\mathbf{d}$<br>$[s\mathbf{d}, -s\mathbf{d}]$ | $p2_1ma$<br>$p1m1$                                     | L28<br>L11 |

Auxiliary tables for Laue class  $D_{2h} - mmm$ Centring types  $P$  and  $I$ 

| Orientation orbit<br>( $hkl$ ) | Conventional basis of the scanning group |                             |                              | Auxiliary basis of the scanning group |                    |                    |
|--------------------------------|--|-----------------------------|------------------------------|---------------------------------------|--------------------|--------------------|
|                                | $\mathbf{a}'$                            | $\mathbf{b}'$               | $\mathbf{d}$                 | $\hat{\mathbf{a}}$                    | $\hat{\mathbf{b}}$ | $\hat{\mathbf{c}}$ |
| ( $mn0$ )                      | $\mathbf{c}$                             | $n\mathbf{a} - m\mathbf{b}$ | $p\mathbf{a} + q\mathbf{b}$  | $\mathbf{a}$                          | $\mathbf{b}$       | $\mathbf{c}$       |
| ( $\bar{m}n0$ )                | $\mathbf{c}$                             | $n\mathbf{a} + m\mathbf{b}$ | $-p\mathbf{a} + q\mathbf{b}$ |                                       |                    |                    |
| ( $0mn$ )                      | $\mathbf{a}$                             | $n\mathbf{b} - m\mathbf{c}$ | $p\mathbf{b} + q\mathbf{c}$  | $\mathbf{b}$                          | $\mathbf{c}$       | $\mathbf{a}$       |
| ( $0\bar{m}n$ )                | $\mathbf{a}$                             | $n\mathbf{b} + m\mathbf{c}$ | $-p\mathbf{b} + q\mathbf{c}$ |                                       |                    |                    |
| ( $n0m$ )                      | $\mathbf{b}$                             | $n\mathbf{c} - m\mathbf{a}$ | $p\mathbf{c} + q\mathbf{a}$  | $\mathbf{c}$                          | $\mathbf{a}$       | $\mathbf{b}$       |
| ( $n0\bar{m}$ )                | $\mathbf{b}$                             | $n\mathbf{c} + m\mathbf{a}$ | $-p\mathbf{c} + q\mathbf{a}$ |                                       |                    |                    |

Arithmetic class  $222P$ 

| Serial No.      | 16      | 17                 | 18                 | 19                 |
|-----------------|---------|--------------------|--------------------|--------------------|
| Group type      | $D_2^1$ | $D_2^2$            | $D_2^3$            | $D_2^4$            |
| Group           | $P222$  | $P222_1$           | $P2_12_12$         | $P2_12_12_1$       |
| ( $mn0$ )       | $P112$  | $P112_1$           | $P112$             | $P112_1$           |
| ( $\bar{m}n0$ ) |         |                    |                    | ( $\mathbf{a}/4$ ) |
| ( $0mn$ )       |         | $P112$             | $P112_1$           | $P112_1$           |
| ( $0\bar{m}n$ ) |         |                    | ( $\mathbf{b}/4$ ) | ( $\mathbf{b}/4$ ) |
| ( $n0m$ )       |         | $P112$             | $P112_1$           | $P112_1$           |
| ( $n0\bar{m}$ ) |         | ( $\mathbf{c}/4$ ) | ( $\mathbf{a}/4$ ) | ( $\mathbf{c}/4$ ) |

Arithmetic class  $mm2P$ 

| Serial No.      | 25         | 26         | 27         | 28                 | 29                 | 30                 | 31                 | 32                 | 33                 | 34                 |
|-----------------|------------|------------|------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Group type      | $C_{2v}^1$ | $C_{2v}^2$ | $C_{2v}^3$ | $C_{2v}^4$         | $C_{2v}^5$         | $C_{2v}^6$         | $C_{2v}^7$         | $C_{2v}^8$         | $C_{2v}^9$         | $C_{2v}^{10}$      |
| Group           | $Pmm2$     | $Pmc2_1$   | $Pcc2$     | $Pma2$             | $Pca2_1$           | $Pnc2$             | $Pmn2_1$           | $Pba2$             | $Pna2_1$           | $Pnm2$             |
| ( $mn0$ )       | $P112$     | $P112_1$   | $P112$     | $P112$             | $P112_1$           | $P112$             | $P112_1$           | $P112$             | $P112_1$           | $P112$             |
| ( $\bar{m}n0$ ) |            |            |            |                    |                    |                    | ( $\mathbf{a}/4$ ) |                    |                    |                    |
| ( $0mn$ )       | $P11m$     | $P11m$     | $P11b$     | $P11m$             | $P11b$             | $P11n$             | $P11m$             | $P11a$             | $P11n$             | $P11n$             |
| ( $0\bar{m}n$ ) |            |            |            | ( $\mathbf{a}/4$ ) | ( $\mathbf{a}/4$ ) |                    |                    | ( $\mathbf{a}/4$ ) | ( $\mathbf{a}/4$ ) | ( $\mathbf{a}/4$ ) |
| ( $n0m$ )       |            | $P11a$     | $P11a$     | $P11b$             | $P11b$             | $P11a$             | $P11n$             | $P11b$             | $P11b$             | $P11n$             |
| ( $n0\bar{m}$ ) |            |            |            |                    |                    | ( $\mathbf{b}/4$ ) |                    | ( $\mathbf{b}/4$ ) | ( $\mathbf{b}/4$ ) | ( $\mathbf{b}/4$ ) |

Arithmetic classes  $222I$ ,  $mm2I$  and  $mmmI$ 

| Serial No.      | 23      | 24                 | 44            | 45            | 46                 | 71            | 72            | 73            | 74   |
|-----------------|---------|--------------------|---------------|---------------|--------------------|---------------|---------------|---------------|--|
| Group type      | $D_2^8$ | $D_{2v}^9$         | $C_{2v}^{20}$ | $C_{2v}^{21}$ | $C_{2v}^{22}$      | $D_{2h}^{25}$ | $D_{2h}^{26}$ | $D_{2h}^{27}$ | $D_{2h}^{28}$                                |
| Group           | $I222$  | $I2_12_12_1$       | $Imm2$        | $Iba2$        | $Ima2$             | $Immm$        | $Ibam$        | $Ibca$        | $Imma$                                       |
| ( $mn0$ )       | $I112$  | $I112$             | $I112$        | $I112$        | $I112$             | $I112/m$      | $I112/m$      | $I112/b$      | $I112/b$                                     |
| ( $\bar{m}n0$ ) |         | ( $\mathbf{b}/4$ ) |               |               |                    |               |               |               |  |
| ( $0mn$ )       |         | $I112$             | $I11m$        | $I11b$        | $I11m$             |               | $I112/b$      |               | $I112/m$                                     |
| ( $0\bar{m}n$ ) |         | ( $\mathbf{c}/4$ ) |               |               | ( $\mathbf{a}/4$ ) |               |               |               |  |
| ( $n0m$ )       |         | $I112$             |               | $I11a$        | $I11b$             |               | $I112/a$      |               | $I112/m$                                     |
| ( $n0\bar{m}$ ) |         | ( $\mathbf{a}/4$ ) |               |               |                    |               |               |               | $[(\mathbf{a} + \mathbf{b} + \mathbf{c})/4]$ |