

$D_6^1$ 

No. 177

P622

| Axes  | Coordinates                              | 1a<br>4h     | 1b<br>6i       | 2c<br>6j     | Wyckoff positions | 2d<br>6k     | 2e<br>6l         | 3f<br>6m       | 3g<br>12n |
|---|--|--------------|----------------|--------------|-------------------|--------------|------------------|----------------|-----------|
| <b>I Maximal translationengleiche subgroups</b> |  |              |                |              |                   |              |                  |                |           |
| [2] P6 (168)                                    |  | 1a<br>2×2b   | 1a<br>2×3c     | 2b<br>6d     | 2b<br>6d          | 2×1a<br>6d   | 3c<br>6d         | 3c<br>2×6d     |           |
| [2] P321 (150)                                  |  | 1a<br>2×2d   | 1b<br>6g       | 2d<br>2×3e   | 2d<br>2×3f        | 2c<br>6g     | 3e<br>6g         | 3f<br>2×6g     |           |
| [2] P312 (149)                                  |  | 1a<br>2h; 2i | 1b<br>6l       | 1c; 1e<br>6l | 1d; 1f<br>6l      | 2g<br>2×3j   | 3j<br>2×3k       | 3k<br>2×6l     |           |
| [3] C222 a, a+2b, c                             | $x - \frac{1}{2}y, \frac{1}{2}y, z$      | 2a<br>8l     | 2d<br>4j; 2×4k | 4g<br>4e; 8l | 4h<br>4f; 8l      | 4i<br>4g; 8l | 2b; 4k<br>4h; 8l | 2c; 4k<br>3×8l |           |
| conjugate: b, -2a-b, c                          | $-\frac{1}{2}x+y, -\frac{1}{2}x, z$      |              |                |              |                   |              |                  |                |           |
| conjugate: -a-b, a-b, c                         | $-\frac{1}{2}(x+y), \frac{1}{2}(x-y), z$ |              |                |              |                   |              |                  |                |           |

**II Maximal klassengleiche subgroups****Enlarged unit cell, non-isomorphic**

|                                 |   |            |            |               |               |               |                   |                 |  |
|---------------------------------|---|------------|------------|---------------|---------------|---------------|-------------------|-----------------|--|
| [2] P6 <sub>3</sub> 22 a, b, 2c | $x, y, \frac{1}{2}z;$<br>$+(0, 0, \frac{1}{2})$               | 2a<br>2×4f | 2b<br>12i  | 4f<br>2×6g    | 2c; 2d<br>12i | 4e<br>12i     | 6g<br>2×6h        | 6h<br>2×12i     |  |
| [2] P6 <sub>3</sub> 22 a, b, 2c | $x, y, \frac{1}{2}z + \frac{1}{4};$<br>$+(0, 0, \frac{1}{2})$ | 2b<br>2×4f | 2a<br>12i  | 2c; 2d<br>12i | 4f<br>2×6g    | 4e<br>2×6h    | 6h<br>12i         | 6g<br>2×12i     |  |
| [3] P6 <sub>4</sub> 22 a, b, 3c | $x, y, \frac{1}{3}z;$<br>$\pm(0, 0, \frac{1}{3})$             | 3a<br>12k  | 3b<br>3×6f | 6i<br>6g; 12k | 6j<br>6h; 12k | 6e<br>6i; 12k | 3c; 6f<br>6j; 12k | 3d; 6f<br>3×12k |  |
| [3] P6 <sub>2</sub> 22 a, b, 3c | $x, y, \frac{1}{3}z;$<br>$\pm(0, 0, \frac{1}{3})$             | 3a<br>12k  | 3b<br>3×6f | 6i<br>6g; 12k | 6j<br>6h; 12k | 6e<br>6i; 12k | 3c; 6f<br>6j; 12k | 3d; 6f<br>3×12k |  |

**Enlarged unit cell, isomorphic**

|                                  |   |   |   |   |   |  |   |   |  |
|----------------------------------|---|---|---|---|---|--|---|---|--|
| [2] P622 a, b, 2c                | $x, y, \frac{1}{2}z;$<br>$+(0, 0, \frac{1}{2})$   | 1a; 1b<br>2×4h  | 2e<br>2×6i  | 2c; 2d<br>6j; 6k  | 4h<br>12n   | 2×2e<br>6l; 6m   | 3f; 3g<br>12n   | 6i<br>2×12n   |  |
| [2] P622 a, b, 2c                | $x, y, \frac{1}{2}z + \frac{1}{4};$<br>$+(0, 0, \frac{1}{2})$   | 2e<br>2×4h  | 1a; 1b<br>2×6i  | 4h<br>12n   | 2c; 2d<br>6j; 6k  | 2×2e<br>12n  | 6i<br>6l; 6m  | 3f; 3g<br>2×12n   |  |
| [3] P622 a, b, 3c                | $x, y, \frac{1}{3}z;$<br>$\pm(0, 0, \frac{1}{3})$   | 1a; 2e<br>3×4h  | 1b; 2e<br>3×6i  | 2c; 4h<br>6j; 12n   | 2d; 4h<br>6k; 12n   | 3×2e<br>6l; 12n  | 3f; 6i<br>6m; 12n   | 3g; 6i<br>3×12n   |  |
| [p] P622 a, b, pc                | $x, y, \frac{1}{p}z;$<br>$+(0, 0, \frac{u}{p})$   | 1a; $\frac{p-1}{2} \times 2e$<br>p×4h   | 1b; $\frac{p-1}{2} \times 2e$<br>p×6i   | 2c; $\frac{p-1}{2} \times 4h$<br>6j; $\frac{p-1}{2} \times 12n$ | 2d; $\frac{p-1}{2} \times 4h$<br>6k; $\frac{p-1}{2} \times 12n$ | p×2e<br>6l; $\frac{p-1}{2} \times 12n$   | 3f; $\frac{p-1}{2} \times 6i$<br>6m; $\frac{p-1}{2} \times 12n$                               | 3g; $\frac{p-1}{2} \times 6i$<br>p×12n  |  |
| $p = \text{prime} > 2;$          |   |   |   |   |   |  |   |   |  |
| $u = 1, \dots, p-1$              |   |   |   |   |   |  |   |   |  |
| [3] P622 2a+b,<br>-a+b, c        | $\frac{1}{3}(x+y),$<br>$\frac{1}{3}(-x+2y), z;$<br>$\pm(\frac{1}{3}, \frac{2}{3}, 0)$                                 | 1a; 2c<br>12n   | 1b; 2d<br>6i; 12n   | 6j<br>3×6l  | 6k<br>3×6m  | 2e; 4h<br>6j; 12n  | 3f; 6l<br>6k; 12n   | 3g; 6m<br>3×12n   |  |
| [4] P622 2a, 2b, c               | $\frac{1}{2}x, \frac{1}{2}y, z;$<br>$+(\frac{1}{2}, 0, 0);$<br>$+(0, \frac{1}{2}, 0); +(\frac{1}{2}, \frac{1}{2}, 0)$ | 1a; 3f<br>4h; 12n   | 1b; 3g<br>2×12n   | 2c; 6l<br>2×6j; 12n   | 2d; 6m<br>2×6k; 12n   | 2e; 6i<br>2×6l; 12n  | 6j; 6l<br>2×6m; 12n   | 6k; 6m<br>4×12n   |  |
| [p <sup>2</sup> ] P622 pa, pb, c | $\frac{1}{p}x, \frac{1}{p}y, z;$<br>$+(\frac{u}{p}, \frac{v}{p}, 0)$  | 1a; $\frac{p-1}{2} \times 6j$<br>$\frac{p-1}{2} \times 6l;$<br>$\frac{(p-1)(p-5)}{12} \times 12n$ | 1b; $\frac{p-1}{2} \times 6k$<br>$\frac{p-1}{2} \times 6m;$<br>$\frac{(p-1)(p-5)}{12} \times 12n$ | 2c;<br>$(p-1) \times 6l;$<br>$\frac{(p-1)(p-2)}{6} \times 12n$  | 2d;<br>$(p-1) \times 6m;$<br>$\frac{(p-1)(p-2)}{6} \times 12n$  | 2e; $\frac{p^2-1}{6} \times 12n$<br>$\frac{p-1}{2} \times 6l;$<br>$\frac{(p-1)^2}{4} \times 12n$ | 3f; $\frac{p-1}{2} \times 6j$<br>$\frac{p-1}{2} \times 6m;$<br>$\frac{(p-1)^2}{4} \times 12n$ | 3g; $\frac{p-1}{2} \times 6k$<br>$\frac{p-1}{2} \times 6m;$<br>$\frac{(p-1)^2}{4} \times 12n$ |  |
| $p = \text{prime} > 4;$          |   |   |   |   |   |  |   |   |  |
| $u, v = 1, \dots, p-1$           |   |   |   |   |   |  |   |   |  |