

$P4/m$

C_{4h}^1

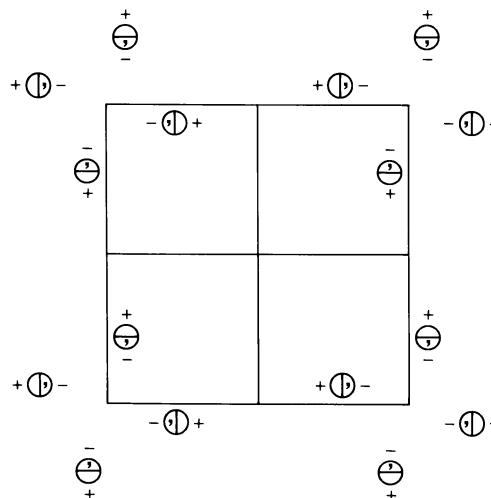
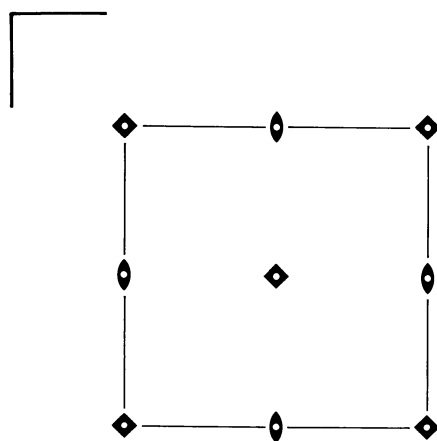
$4/m$

Tetragonal

No. 83

$P4/m$

Patterson symmetry $P4/m$



Origin at centre ($4/m$)

Asymmetric unit $0 \leq x \leq \frac{1}{2}; 0 \leq y \leq \frac{1}{2}; 0 \leq z \leq \frac{1}{2}$

Symmetry operations

- (1) 1 (2) 2 $0,0,z$ (3) 4^+ $0,0,z$ (4) 4^- $0,0,z$
 (5) $\bar{1}$ $0,0,0$ (6) m $x,y,0$ (7) $\bar{4}^+$ $0,0,z; 0,0,0$ (8) $\bar{4}^-$ $0,0,z; 0,0,0$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; (2); (3); (5)

Positions

Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

Reflection conditions

- | | | | | | | |
|---|----------|---|-------------------------------|-------------------------|-------------------------|-------------------------|
| 8 | <i>l</i> | 1 | (1) x,y,z | (2) \bar{x},\bar{y},z | (3) \bar{y},x,z | (4) y,\bar{x},z |
| | | | (5) \bar{x},\bar{y},\bar{z} | (6) x,y,\bar{z} | (7) y,\bar{x},\bar{z} | (8) \bar{y},x,\bar{z} |

General:

no conditions

Special:

- | | | | | | | |
|---|----------|-------|-------------------|-------------------------------|-------------------------|-------------------------|
| 4 | <i>k</i> | $m..$ | $x,y,\frac{1}{2}$ | $\bar{x},\bar{y},\frac{1}{2}$ | $\bar{y},x,\frac{1}{2}$ | $y,\bar{x},\frac{1}{2}$ |
|---|----------|-------|-------------------|-------------------------------|-------------------------|-------------------------|

no extra conditions

- | | | | | | | |
|---|----------|-------|---------|---------------------|---------------|---------------|
| 4 | <i>j</i> | $m..$ | $x,y,0$ | $\bar{x},\bar{y},0$ | $\bar{y},x,0$ | $y,\bar{x},0$ |
|---|----------|-------|---------|---------------------|---------------|---------------|

no extra conditions

- | | | | | | | |
|---|----------|-------|-------------------|-------------------|-------------------------|-------------------------|
| 4 | <i>i</i> | $2..$ | $0,\frac{1}{2},z$ | $\frac{1}{2},0,z$ | $0,\frac{1}{2},\bar{z}$ | $\frac{1}{2},0,\bar{z}$ |
|---|----------|-------|-------------------|-------------------|-------------------------|-------------------------|

$hkl: h+k=2n$

- | | | | | | | |
|---|----------|-------|-----------------------------|-----------------------------------|--|--|
| 2 | <i>h</i> | $4..$ | $\frac{1}{2},\frac{1}{2},z$ | $\frac{1}{2},\frac{1}{2},\bar{z}$ | | |
|---|----------|-------|-----------------------------|-----------------------------------|--|--|

no extra conditions

- | | | | | | | |
|---|----------|-------|---------|---------------|--|--|
| 2 | <i>g</i> | $4..$ | $0,0,z$ | $0,0,\bar{z}$ | | |
|---|----------|-------|---------|---------------|--|--|

no extra conditions

- | | | | | | | |
|---|----------|---------|-----------------------------|-----------------------------|--|--|
| 2 | <i>f</i> | $2/m..$ | $0,\frac{1}{2},\frac{1}{2}$ | $\frac{1}{2},0,\frac{1}{2}$ | | |
|---|----------|---------|-----------------------------|-----------------------------|--|--|

$hkl: h+k=2n$

- | | | | | | | |
|---|----------|---------|-------------------|-------------------|--|--|
| 2 | <i>e</i> | $2/m..$ | $0,\frac{1}{2},0$ | $\frac{1}{2},0,0$ | | |
|---|----------|---------|-------------------|-------------------|--|--|

$hkl: h+k=2n$

- | | | | | | | |
|---|----------|---------|---------------------------------------|--|--|--|
| 1 | <i>d</i> | $4/m..$ | $\frac{1}{2},\frac{1}{2},\frac{1}{2}$ | | | |
|---|----------|---------|---------------------------------------|--|--|--|

no extra conditions

- | | | | | | | |
|---|----------|---------|-----------------------------|--|--|--|
| 1 | <i>c</i> | $4/m..$ | $\frac{1}{2},\frac{1}{2},0$ | | | |
|---|----------|---------|-----------------------------|--|--|--|

no extra conditions

- | | | | | | | |
|---|----------|---------|-------------------|--|--|--|
| 1 | <i>b</i> | $4/m..$ | $0,0,\frac{1}{2}$ | | | |
|---|----------|---------|-------------------|--|--|--|

no extra conditions

- | | | | | | | |
|---|----------|---------|---------|--|--|--|
| 1 | <i>a</i> | $4/m..$ | $0,0,0$ | | | |
|---|----------|---------|---------|--|--|--|

no extra conditions

Symmetry of special projections

Along $[001]$ $p4$
 $\mathbf{a}' = \mathbf{a}$ $\mathbf{b}' = \mathbf{b}$
 Origin at $0,0,z$

Along $[100]$ $p2mm$
 $\mathbf{a}' = \mathbf{b}$ $\mathbf{b}' = \mathbf{c}$
 Origin at $x,0,0$

Along $[110]$ $p2mm$
 $\mathbf{a}' = \frac{1}{2}(-\mathbf{a} + \mathbf{b})$ $\mathbf{b}' = \mathbf{c}$
 Origin at $x,x,0$