

MSG No. 62.448  $Pn'ma'$  [ Type III, orthorhombic ]

\* symmetry operation

Table 1: Symmetry operations for 3d polar vector.

| No. | tag  | matrix (polar)  | det | TR |
|-----|--|---|-----|----|
| 1   | {1 0}  | $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$                                 | 1   | 1  |
| 2   | {2 <sub>010</sub>  0 <sub>2</sub> <sup>1</sup> 0}  | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{bmatrix}$                     | 1   | 1  |
| 3   | {-1 0}   | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$                              | -1  | 1  |
| 4   | {m <sub>010</sub>  0 <sub>2</sub> <sup>1</sup> 0}  | $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{bmatrix}$                      | -1  | 1  |
| 5   | {2 <sub>100</sub> '  <sub>2</sub> <sup>1</sup> <sub>2</sub> <sup>1</sup> <sub>2</sub> <sup>1</sup> } | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$ | 1   | -1 |
| 6   | {2 <sub>001</sub> '  <sub>2</sub> <sup>1</sup> 0 <sub>2</sub> <sup>1</sup> }                         | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$           | 1   | -1 |
| 7   | {m <sub>100</sub> '  <sub>2</sub> <sup>1</sup> <sub>2</sub> <sup>1</sup> <sub>2</sub> <sup>1</sup> } | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$  | -1  | -1 |
| 8   | {m <sub>001</sub> '  <sub>2</sub> <sup>1</sup> 0 <sub>2</sub> <sup>1</sup> }                         | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$            | -1  | -1 |