

SG No. 121 D_{2d}^{11} $I\bar{4}2m$ [tetragonal]

* generator : $\{2_{001}|0\}$, $\{-4_{001}^+|0\}$, $\{2_{010}|0\}$

* symmetry operation + [0, 0, 0], + [$\frac{1}{2}, \frac{1}{2}, \frac{1}{2}$]

Table 1: Symmetry operations for 3d polar vector.

| No. | tag | matrix (polar) | det |
|-----|--------------------|---|-----|
| 1 | $\{1 0\}$ | $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$ | 1 |
| 2 | $\{2_{001} 0\}$ | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$ | 1 |
| 3 | $\{-4_{001}^+ 0\}$ | $\begin{bmatrix} 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$ | -1 |
| 4 | $\{-4_{001}^- 0\}$ | $\begin{bmatrix} 0 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$ | -1 |
| 5 | $\{2_{010} 0\}$ | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$ | 1 |
| 6 | $\{2_{100} 0\}$ | $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$ | 1 |
| 7 | $\{m_{110} 0\}$ | $\begin{bmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$ | -1 |
| 8 | $\{m_{1-10} 0\}$ | $\begin{bmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$ | -1 |