

SG No. 75  $C_4^1$   $P4$  [ tetragonal ]

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

\* symmetry operation + [0, 0, 0]

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   |