

MSG No. 60.418 *Pbcn1'* [ Type II, 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>100</sub>   $\frac{1}{2}\frac{1}{2}0$ }            | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{bmatrix}$           | 1   | 1  |
| 3   | {2 <sub>010</sub>  00 $\frac{1}{2}$ }                      | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$                     | 1   | 1  |
| 4   | {2 <sub>001</sub>   $\frac{1}{2}\frac{1}{2}\frac{1}{2}$ }  | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$ | 1   | 1  |
| 5   | {-1 0}   | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$                              | -1  | 1  |
| 6   | {m <sub>100</sub>   $\frac{1}{2}\frac{1}{2}0$ }            | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{bmatrix}$            | -1  | 1  |
| 7   | {m <sub>010</sub>  00 $\frac{1}{2}$ }                      | $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$                      | -1  | 1  |
| 8   | {m <sub>001</sub>   $\frac{1}{2}\frac{1}{2}\frac{1}{2}$ }  | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$  | -1  | 1  |
| 9   | {1' 0}   | $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$                                 | 1   | -1 |
| 10  | {2 <sub>100</sub> '  $\frac{1}{2}\frac{1}{2}0$ }           | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{bmatrix}$           | 1   | -1 |
| 11  | {2 <sub>010</sub> ' 00 $\frac{1}{2}$ }                     | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$                     | 1   | -1 |
| 12  | {2 <sub>001</sub> '  $\frac{1}{2}\frac{1}{2}\frac{1}{2}$ } | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$ | 1   | -1 |
| 13  | {-1' 0}  | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$                              | -1  | -1 |

*continued ...*

Table 1

| No. | tag  | matrix (polar)   | det | TR |
|-----|--|--|-----|----|
| 14  | $\{m_{100}' \frac{1}{2}\frac{1}{2}0\}$           | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{bmatrix}$           | -1  | -1 |
| 15  | $\{m_{010}' 00\frac{1}{2}\}$                     | $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$                     | -1  | -1 |
| 16  | $\{m_{001}' \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$ | -1  | -1 |