PG No. 31 T_d $\bar{4}3m$ [cubic]

* generator : 2_{001}, 2_{010}, 3^+_{111}, m_{1-10}

* conjugacy class

$$
\begin{aligned}
[1] &: \quad 1 \\
[2_{001}] &: \quad 2_{001},\ 2_{100},\ 2_{010} \\
[3^+_{111}] &: \quad 3^+_{111},\ 3^+_{1-1-1},\ 3^+_{-11-1},\ 3^+_{-1-11},\ 3^-_{111},\ 3^-_{1-1-1},\ 3^-_{-11-1},\ 3^-_{-1-11} \\
[m_{110}] &: \quad m_{110},\ m_{101},\ m_{011},\ m_{1-10},\ m_{-101},\ m_{01-1} \\
[-4^+_{001}] &: \quad -4^+_{001},\ -4^+_{100},\ -4^+_{010},\ -4^-_{001},\ -4^-_{100},\ -4^-_{010}
\end{aligned}
$$

* symmetry operation

Table 1: Symmetry operations for 3d polar vector.

No.	tag	matrix (polar)	det
1	1	$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$	1
2	2_{001}	$\begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$	1
3	2_{010}	$\begin{bmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$	1
4	2_{100}	$\begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$	1
5	3^+_{111}	$\begin{bmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$	1
6	3^+_{-11-1}	$\begin{bmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{bmatrix}$	1
7	3^+_{1-1-1}	$\begin{bmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$	1
8	3^+_{-1-11}	$\begin{bmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{bmatrix}$	1
9	3^-_{111}	$\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}$	1
10	3^-_{1-1-1}	$\begin{bmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{bmatrix}$	1
11	3^-_{-1-11}	$\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{bmatrix}$	1

Table 1

No.	tag	matrix (polar)	det
12	3^-_{-11-1}	$\begin{bmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{bmatrix}$	1
13	m_{1-10}	$\begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$	-1
14	m_{110}	$\begin{bmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$	-1
15	-4^+_{001}	$\begin{bmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{bmatrix}$	-1
16	-4^-_{001}	$\begin{bmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{bmatrix}$	-1
17	m_{01-1}	$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix}$	-1
18	-4^+_{100}	$\begin{bmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{bmatrix}$	-1
19	-4^-_{100}	$\begin{bmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{bmatrix}$	-1
20	m_{011}	$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{bmatrix}$	-1
21	m_{-101}	$\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$	-1
22	-4^-_{010}	$\begin{bmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$	-1
23	m_{101}	$\begin{bmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$	-1
24	-4^+_{010}	$\begin{bmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$	-1