* character table

| $O_{\mathrm{h}}$ | 1(1) | $2_{001}(3)$ | $2_{110}(6)$ | $3^{+}_{111}(8)$ | $4^{+}_{001}(6)$ | $-1(1)$ | $\mathrm{m}_{001}(3)$ | $\mathrm{m}_{110}(6)$ | $-3^{+}_{111}(8)$ | $-4^{+}_{001}(6)$ |
|---|---|---|---|---|---|---|---|---|---|---|
| $A_{1g}$ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $A_{2g}$ | 1 | 1 | $-1$ | 1 | $-1$ | 1 | 1 | $-1$ | 1 | $-1$ |
| $E_g$ | 2 | 2 | 0 | $-1$ | 0 | 2 | 2 | 0 | $-1$ | 0 |
| $T_{1g}$ | 3 | $-1$ | $-1$ | 0 | 1 | 3 | $-1$ | $-1$ | 0 | 1 |
| $T_{2g}$ | 3 | $-1$ | 1 | 0 | $-1$ | 3 | $-1$ | 1 | 0 | $-1$ |
| $A_{1u}$ | 1 | 1 | 1 | 1 | 1 | $-1$ | $-1$ | $-1$ | $-1$ | $-1$ |
| $A_{2u}$ | 1 | 1 | $-1$ | 1 | $-1$ | $-1$ | $-1$ | 1 | $-1$ | 1 |
| $E_u$ | 2 | 2 | 0 | $-1$ | 0 | $-2$ | $-2$ | 0 | 1 | 0 |
| $T_{1u}$ | 3 | $-1$ | $-1$ | 0 | 1 | $-3$ | 1 | 1 | 0 | $-1$ |
| $T_{2u}$ | 3 | $-1$ | 1 | 0 | $-1$ | $-3$ | 1 | $-1$ | 0 | 1 |

* polar ↔ axial conversion

$A_{1g}$ $(A_{1u})$   $A_{2g}$ $(A_{2u})$   $E_g$ $(E_u)$   $T_{1g}$ $(T_{1u})$   $T_{2g}$ $(T_{2u})$   $A_{1u}$ $(A_{1g})$   $A_{2u}$ $(A_{2g})$   $E_u$ $(E_g)$   $T_{1u}$ $(T_{1g})$   $T_{2u}$ $(T_{2g})$

* symmetric product

| | $A_{1g}$ | $A_{2g}$ | $E_g$ | $T_{1g}$ | $T_{2g}$ | $A_{1u}$ | $A_{2u}$ | $E_u$ | $T_{1u}$ | $T_{2u}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| $A_{1g}$ | $A_{1g}$ | $A_{2g}$ | $E_g$ | $T_{1g}$ | $T_{2g}$ | $A_{1u}$ | $A_{2u}$ | $E_u$ | $T_{1u}$ | $T_{2u}$ |
| $A_{2g}$ | | $A_{1g}$ | $E_g$ | $T_{2g}$ | $T_{1g}$ | $A_{2u}$ | $A_{1u}$ | $E_u$ | $T_{2u}$ | $T_{1u}$ |
| $E_g$ | | | $A_{1g}+E_g$ | $T_{1g}+T_{2g}$ | $T_{1g}+T_{2g}$ | $E_u$ | $E_u$ | $A_{1u}+A_{2u}+E_u$ | $T_{1u}+T_{2u}$ | $T_{1u}+T_{2u}$ |
| $T_{1g}$ | | | | $A_{1g}+E_g+T_{2g}$ | $A_{2g}+E_g+T_{1g}+T_{2g}$ | $T_{1u}$ | $T_{2u}$ | $T_{1u}+T_{2u}$ | $A_{1u}+E_u+T_{1u}+T_{2u}$ | $A_{2u}+E_u+T_{1u}+T_{2u}$ |
| $T_{2g}$ | | | | | $A_{1g}+E_g+T_{2g}$ | $T_{2u}$ | $T_{1u}$ | $T_{1u}+T_{2u}$ | $A_{2u}+E_u+T_{1u}+T_{2u}$ | $A_{1u}+E_u+T_{1u}+T_{2u}$ |
| $A_{1u}$ | | | | | | $A_{1g}$ | $A_{2g}$ | $E_g$ | $T_{1g}$ | $T_{2g}$ |
| $A_{2u}$ | | | | | | | $A_{1g}$ | $E_g$ | $T_{2g}$ | $T_{1g}$ |
| $E_u$ | | | | | | | | $A_{1g}+E_g$ | $T_{1g}+T_{2g}$ | $T_{1g}+T_{2g}$ |
| $T_{1u}$ | | | | | | | | | $A_{1g}+E_g+T_{2g}$ | $A_{2g}+E_g+T_{1g}+T_{2g}$ |
| $T_{2u}$ | | | | | | | | | | $A_{1g}+E_g+T_{2g}$ |

* anti-symmetric product

| $A_{1g}$ | $A_{2g}$ | $E_g$ | $T_{1g}$ | $T_{2g}$ | $A_{1u}$ | $A_{2u}$ | $E_u$ | $T_{1u}$ | $T_{2u}$ |
|---|---|---|---|---|---|---|---|---|---|
| $-$ | $-$ | $A_{2g}$ | $T_{1g}$ | $T_{1g}$ | $-$ | $-$ | $A_{2g}$ | $T_{1g}$ | $T_{1g}$ |