

Structure

Linear or low symmetry

Yes

linear

Yes

Yes

$D_{\infty h}$

No

$C_{\infty v}$

linear

S

Yes

C_s

No

i

Yes

C_i

No

C_1

single element

Special Group Elements

highly symmetric (octahedral, tetrahedral, icosahedral)

Yes

Sure? More than one C_n axis of C3 or higher?

Yes

$6C_5$

Yes

i

Yes

I_h

No

I

icosahedral

$3C_4$

Yes

i

Yes

O_h

No

O

octahedral

$3S_4$

Yes

T_d

Tetrahedral

No

i

Yes

T_h

No

T

High Symmetry Elements

Normal symmetry

Yes

$C_2 \perp C_n$

Yes

S_h

Yes

D_{nh}

No

nS_d

Yes

D_{nd}

No

D_n

Dihedral

S_h

Yes

C_{nh}

No

nS_v

Yes

C_{nv}

No

S_{2n}

Yes

S_{2n}

No

C_n

Single Axis

Normal Symmetry Elements (most common)