

How do the group elements act on coordinates?

$$C_2 : x \rightarrow -x, y \rightarrow -y$$

$$\sigma_v : x \rightarrow x, y \rightarrow -y$$

$$\sigma'_v : x \rightarrow -x, y \rightarrow y$$

For all operations, $z \rightarrow z$.

Table of characters

C_{2v}	I	C_2	σ_v	σ'_v
z, A_1	1	1	1	1
xy, A_2	1	1	-1	-1
x, B_1	1	-1	1	-1
y, B_2	1	-1	-1	1

$A_{1,2}$ even under C_2 , $B_{1,2}$ odd under C_2 .

We know that $N_v = 3$ but we have 4 irreps.

Some of the irreps do not correspond to molecular vibrations!

Need to get rid of irreps that correspond to translations and rotations rather than to vibrations.