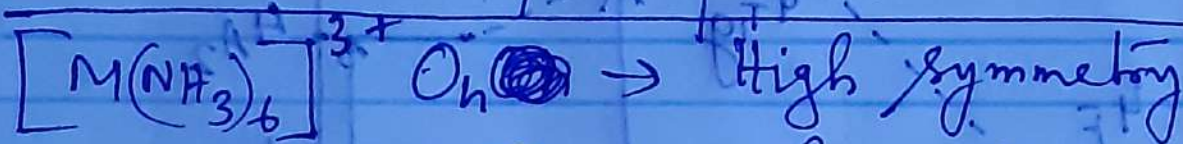
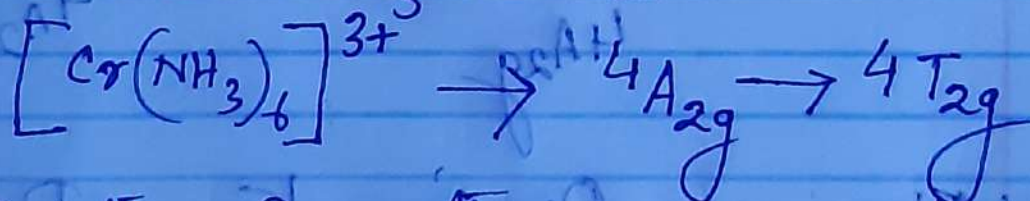
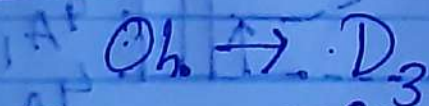


Some examples of Lowering of symmetry & relaxation of Laporte selection rules:-



Case $\rightarrow 1$: D_3 (Lower symmetry)

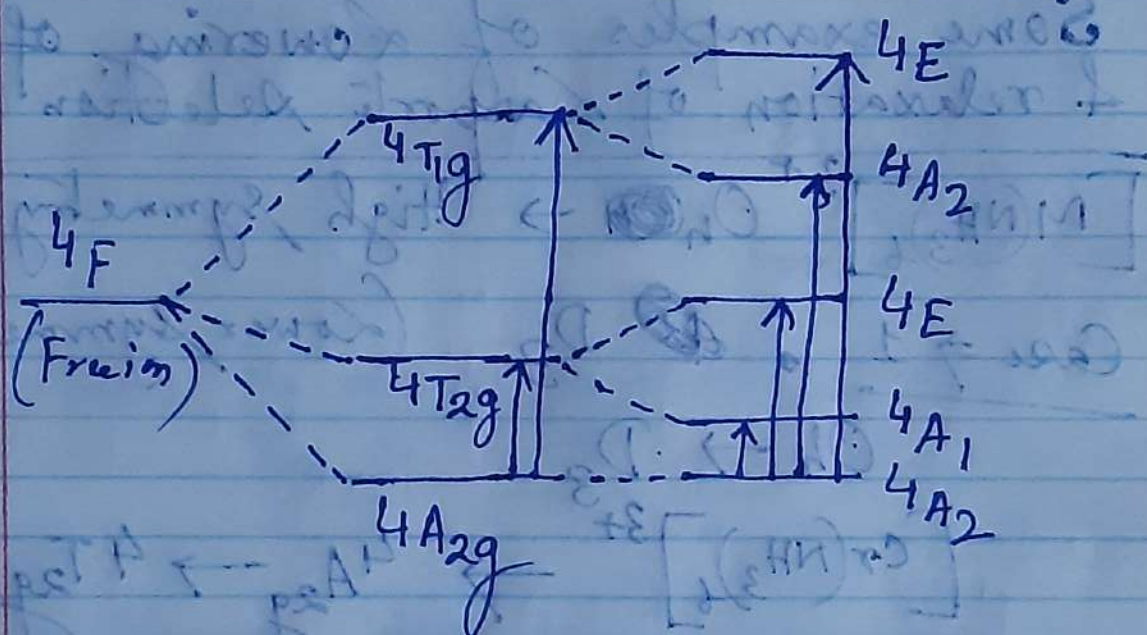


For this case, the ground and excited state are of symmetry. As the dipole moment operator is of symmetry (as discussed in earlier class) then transition moment integral is zero. Thus an obvious forbidden electron transition occurs.

In moving from O_h to D_3 point group the T_{2g} term of O_h splits into A_1 & E' states.

From the detailed calculation it has been observed that $4A_2 \rightarrow 4A_1$ transition is allowed in Z direction.

Extension of ORBEL diagram:-



* Note

Generally it has been seen that lowering of symmetry produces more spectral lines. For μ_z $4A_2 \rightarrow 4A_1$ is allowed. For $\mu_{x,y}$ (1 to C_3 axis), $4A_2 \rightarrow 4A_1$ is forbidden.

Home tasks:- Search the possible allowed transition for D_{4h} & C_{2v} system.