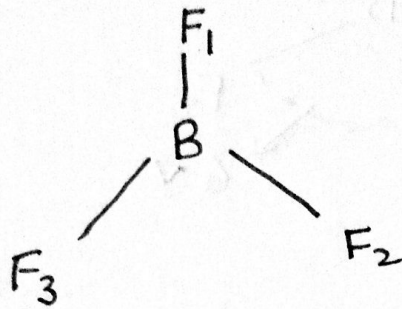


σ_h σ_v C_2 σ_{xz} σ_{yz}

PG Semister II

Plane of symmetry in different molecules.

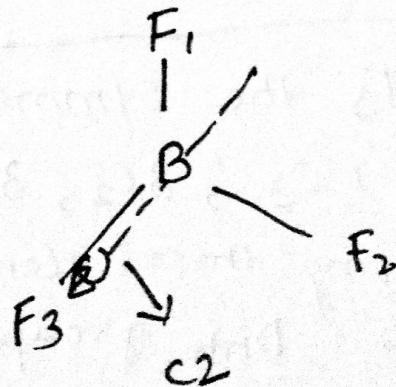
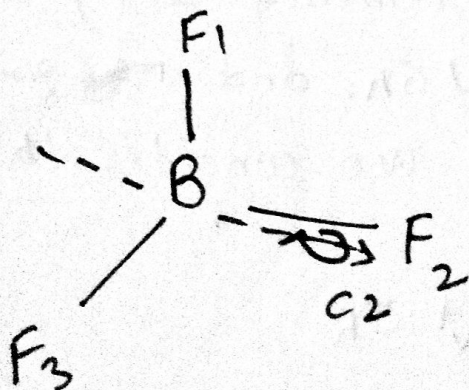
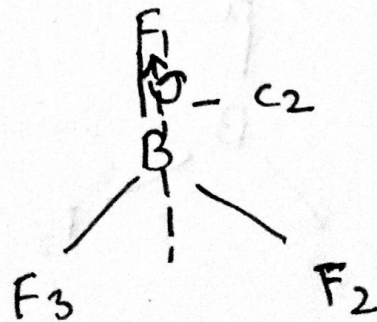
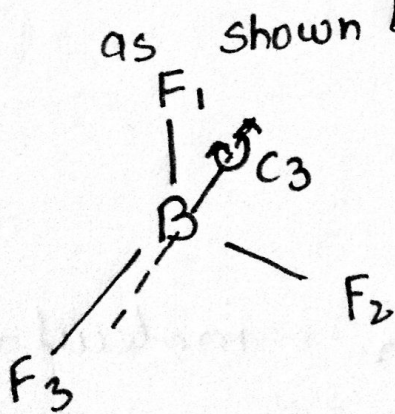
Example-1. BF_3

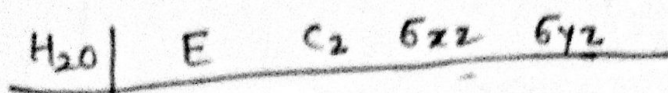


Symmetry elements.

- Two axis of symmetry.
 - i) C_3 axis passing through central Boron atom.
 - ii) $3C_2$ axis passing through each B-F bond. i.e.
 - B-F₁.
 - B-F₂.
 - B-F₃.

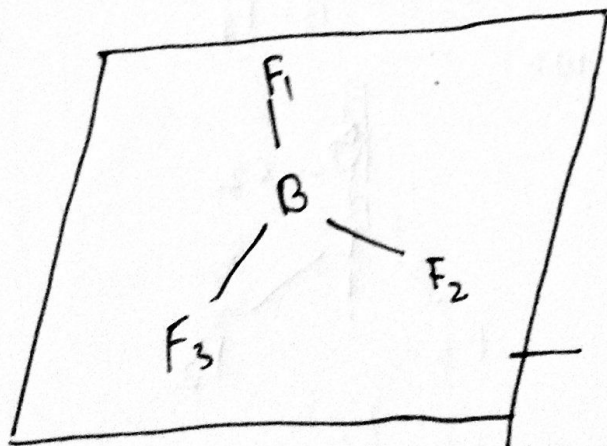
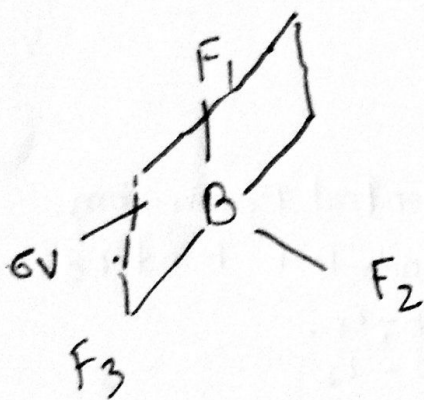
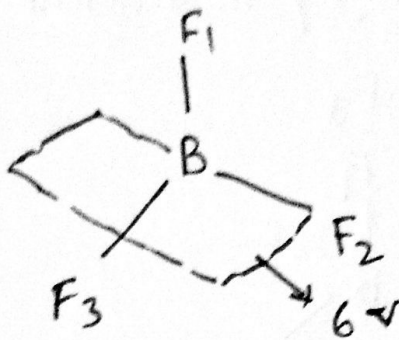
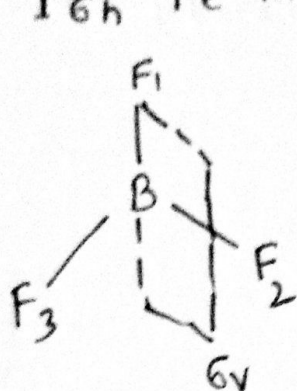
as shown below:-





→ 3 σ_v plane against each C_2 axis.

→ 1 σ_h i.e. molecular plane.



So In BF_3 the symmetry elements ~~are~~ present are $E, 1 C_3, 3 C_2, 3 \sigma_v, 1 \sigma_h$ and 1 S_6 axis. after observing these elements we consider that it belongs to D_{nh} group.

$$D_{nh} = C_n + n C_2 + n \sigma_v + \sigma_h$$

$$D_{3h} = C_3 + 3 C_2 + 3 \sigma_v + \sigma_h$$

So. point group of BF_3 is D_{3h} .