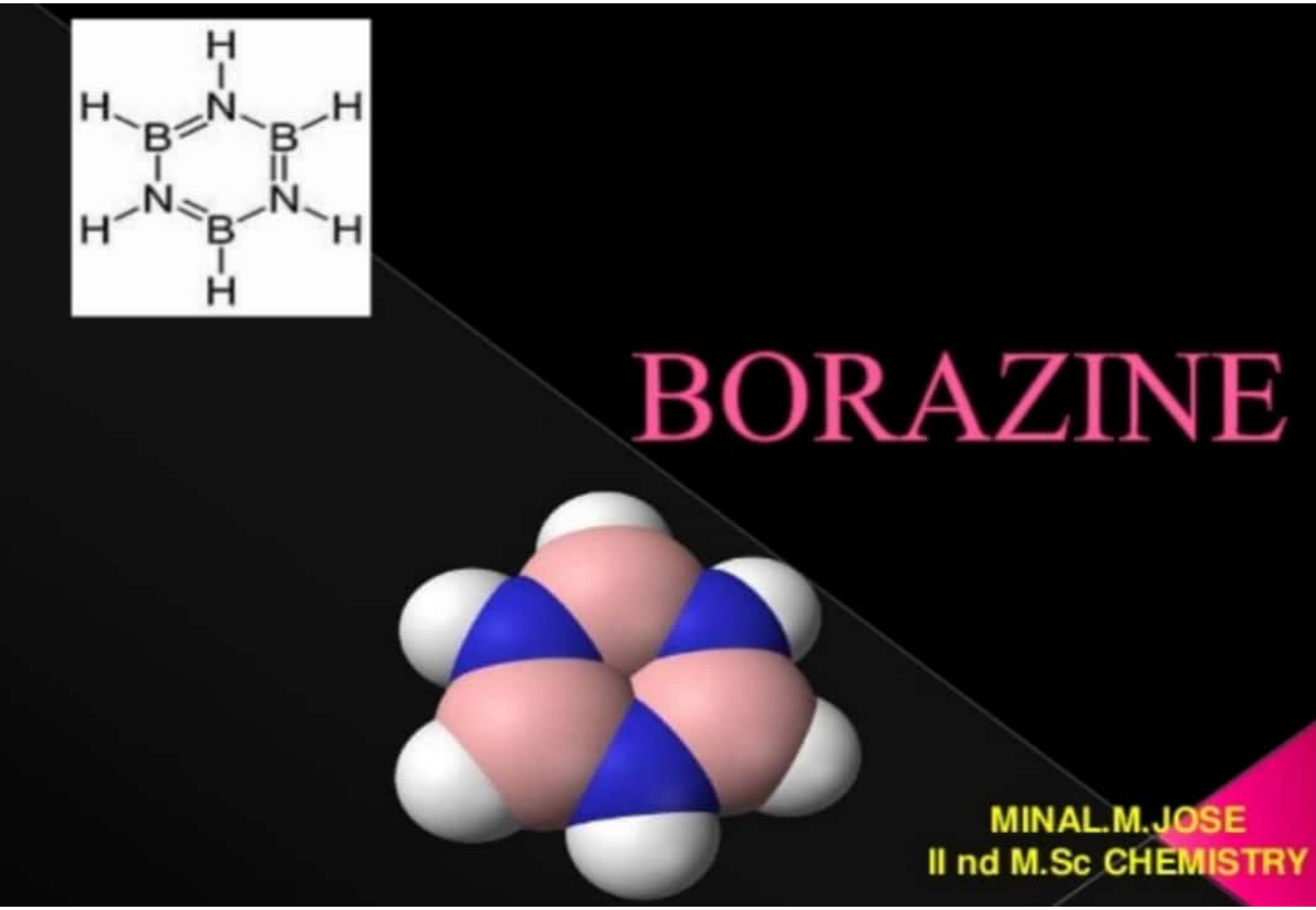


Borazine or Borazole, $(BH)_3(NH)_3$ or $B_3N_3H_6$


Borazine


Benzene

- **Isoelectronic with benzene and hence as been called INORGANIC BENZENE by *Weberg***

Stucture of Borazine

Various chemical reactions and electron diffracti studies shows that Borazine is isoelectronic with Benzene and hence its stucture is the same as that of Benzene.

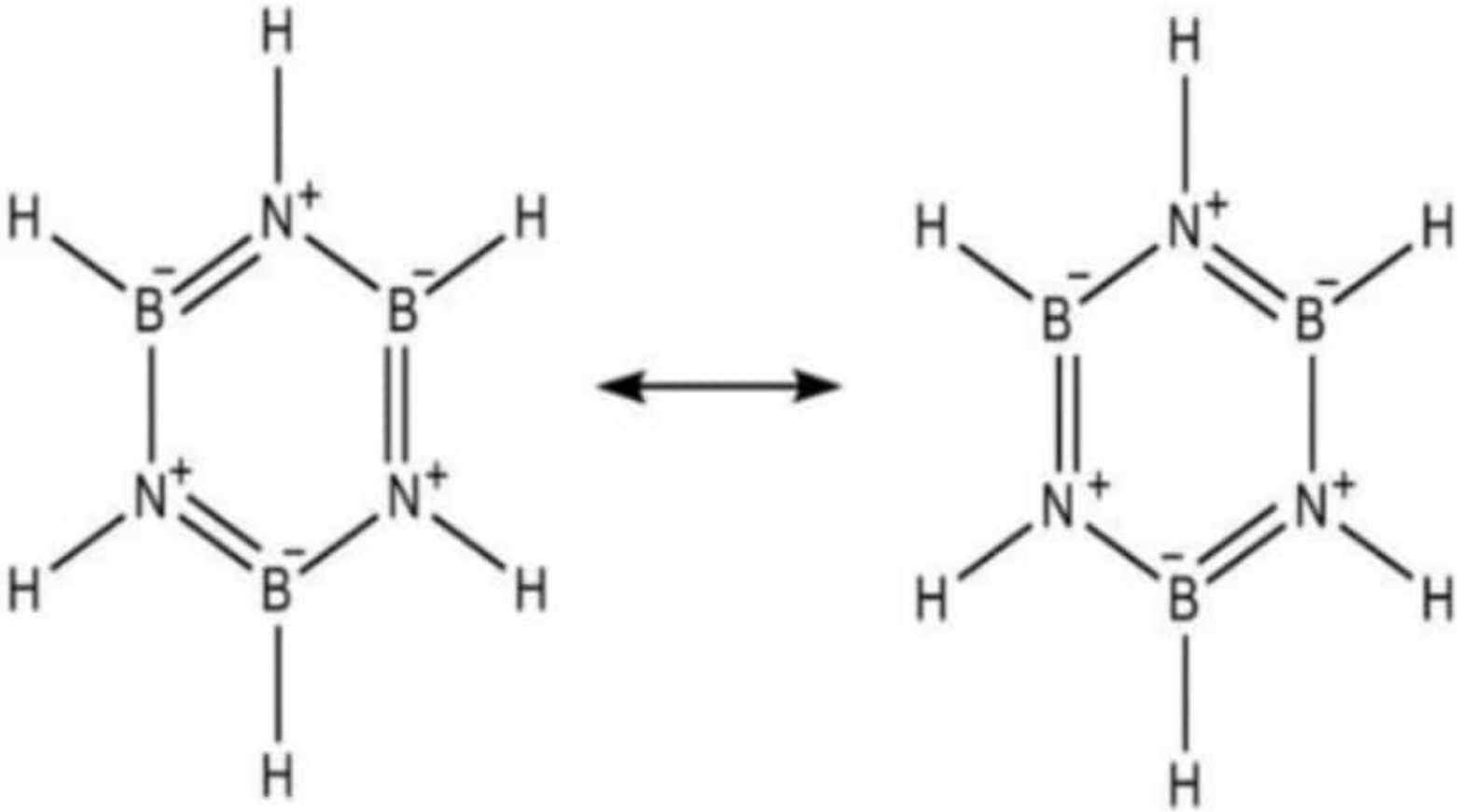
Like Benzene ,borazine has a planar hexagonal structure ,containing 6 membered ring , in whi B and N atoms are arranged alternately

Because of the similarity between the structures borazine and benzene that borazine is called Inorganic benzene.

Stucture of Borazine

- In Borazine both Boron and Nitrogen are sp2 hybridised
- Each N-atom has one lone pair of electrons ,while each B-atom has an empty p-orbital.
- (B-N)□-bond in borazine is a Dative bond ,which arises from the sidewise overlap between the filled p-orbitals of N-atom and empty p-orbitals of B-atom.

- Since borazine is isoelectronic with benzene ,both the compounds have aromatic □-electron cloud.
- Due to greater difference in electronegativity values of B and N-atoms ,the □-electron cloud in B3N3 ring of borazine molecule is partially delocalised (since N-□ orbitals are of lower energy than the B-□ orbitals)
- while in case of benzene ring ,the □-electron cloud is completely delocalised.



- M.O calculations have indicated that □-eletron drift from N to B is less than the ⊐-electron drift from B to N ,due to greater electronegativity of N-atom.
- In benzene molecule ,C=C bonds are nonpolar ,while in case of B3N3H6 ,due to the difference in electronegativities between B and N atom ,B-N bond is polar.
- It is due to the partial delocalisation of ⊐-electron cloud that □-bonding in B3N3 ring is weakend.

- N-atom retains some of its basicity and B-atoms retains some of its acidity.
- Polar species like HCl ,therefore ,attack the double bond between N and B. i.e why borazine in contrast to benzrne ,readily undergoes addition reaction.
- In borazine B-N bond length is equal to 1.44 A° ,which is between calculated single B-N bond (1.54 A°)
- B=N bond length is 1.36 A°
- The angles are equal to 120°
- In benzene C-C bond length is 1.42 A°