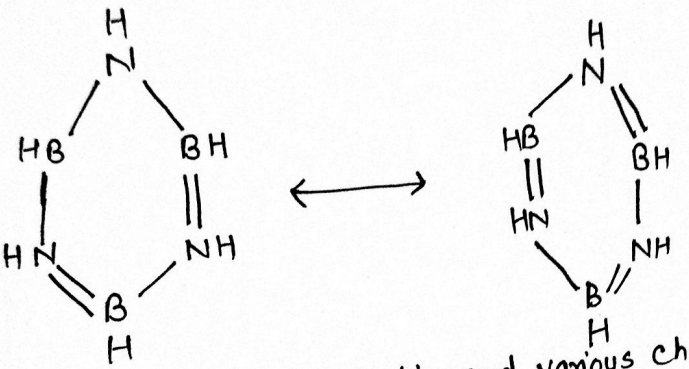
Borazine or Borazole ($B_3N_3H_6$)

Borazine is a compound of Boron which is isoelectronic with benzene. So, this compound is also sometimes known as inorganic benzene.

Structure of Borazine



Electron diffraction studies and various chemical reactions of this compound have shown that this is isoelectronic with benzene and its structure is similar to that of benzene. It has a planar hexagonal structure containing six membered ring with alternate B and N atoms. i.e B-H and -NH groups.

Each of B-N bond distances is 1.44 Å which is approximate average of B-N (1.54 Å) and double B-N (1.36 Å) bond distances. All the angles are equal to 120°. Like benzene, this compound is also have aromatic π electron cloud which is delocalized over the atoms of the ring. The B-N bonds are polar with π cloud localized more on N- atoms. This weakens the π bonding in the ring and hence polar species like HCl can attack this double bond between B and N. and the molecule can undergo addition reaction readily.

All the B and N atoms in the ring presumably use sp^2 hybrid orbitals to form three B-N σ bonds and B-N π bonds arise from the sideways overlapping of the unhybridised p- orbitals of B and N atoms which are at right angles to the plane of the ring and π-electrons are not derived from all the six atoms of the ring but from the three N- atoms only.