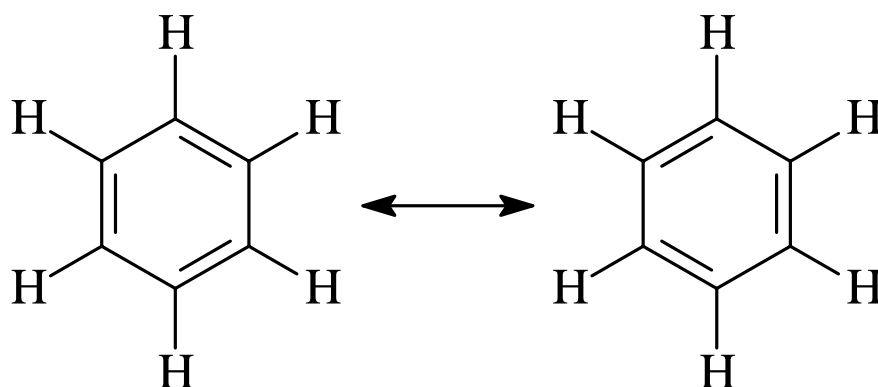


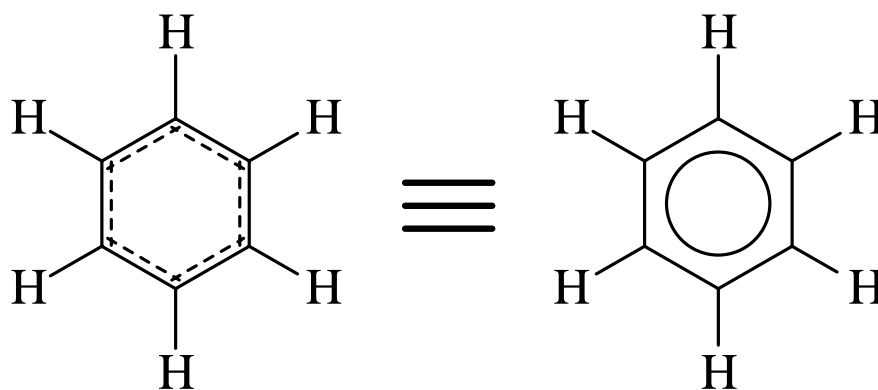
Molecular orbital and valence-bond theory

Bonding in benzene

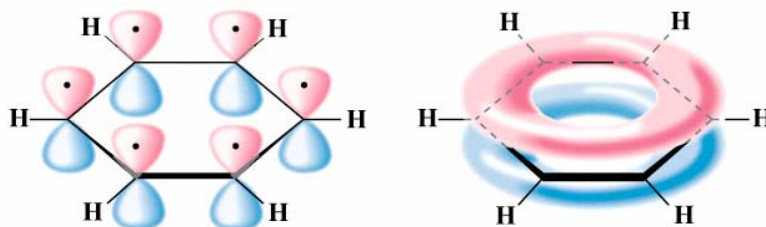
Conjugation in π -Systems: Valence-Bond Benzene

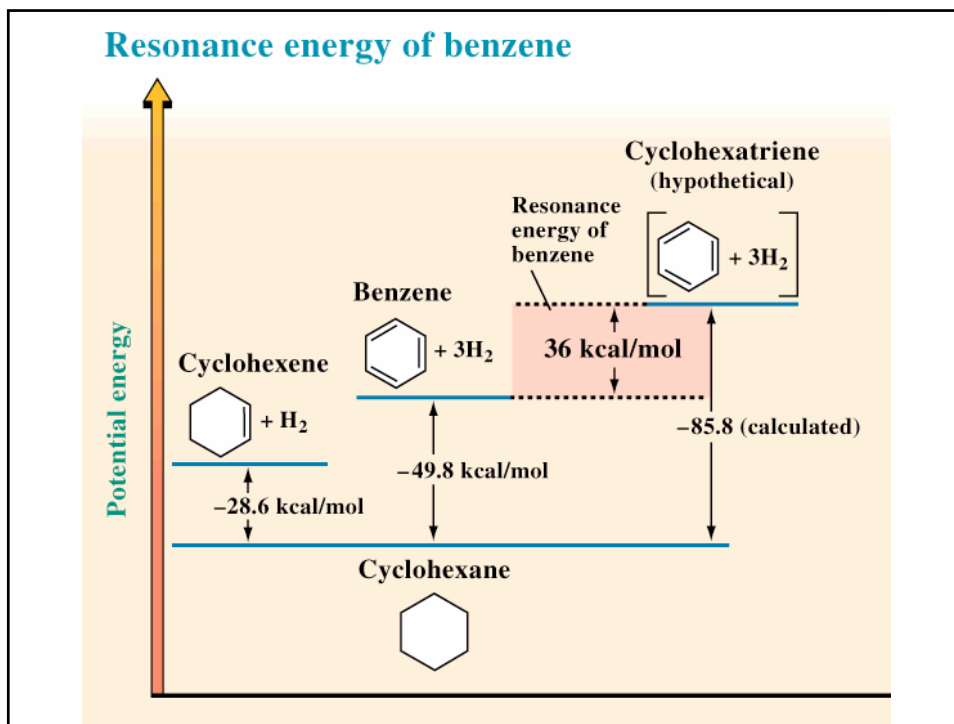


Conjugation in π -Systems: Valence-Bond Benzene



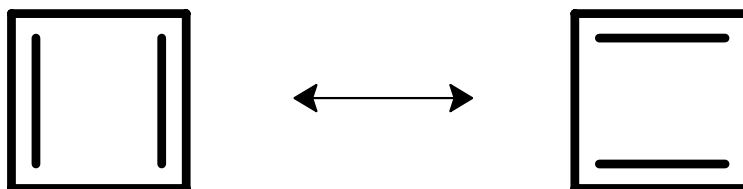
Conjugation in π -Systems: Valence-Bond Benzene



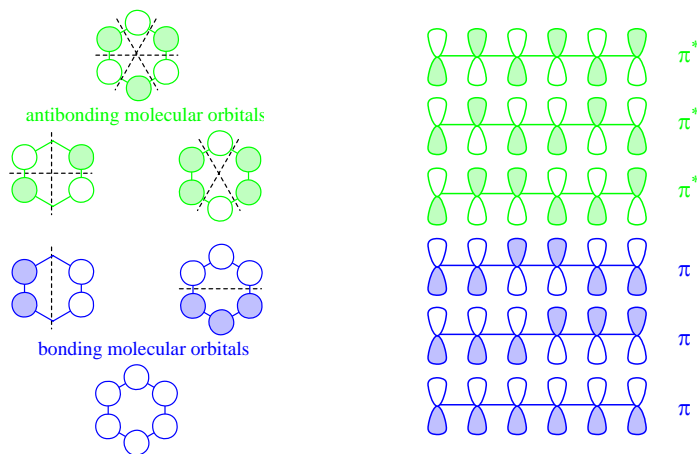


Failure of the qualitative VB model

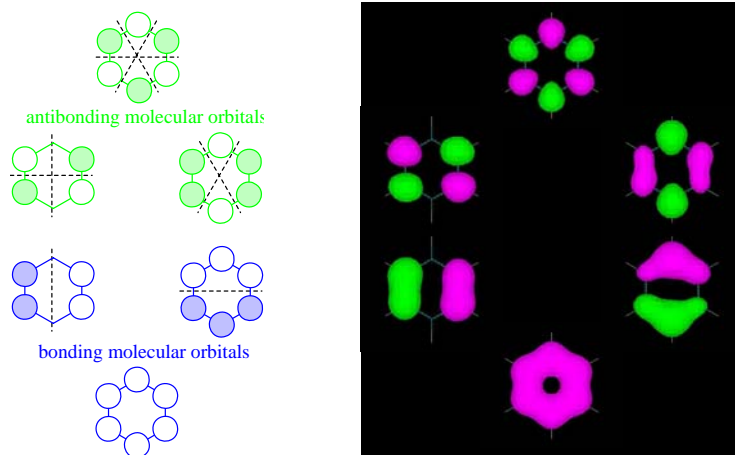
- Benzene is stable
- Cyclobutadiene is unstable
 - Why should this be so??



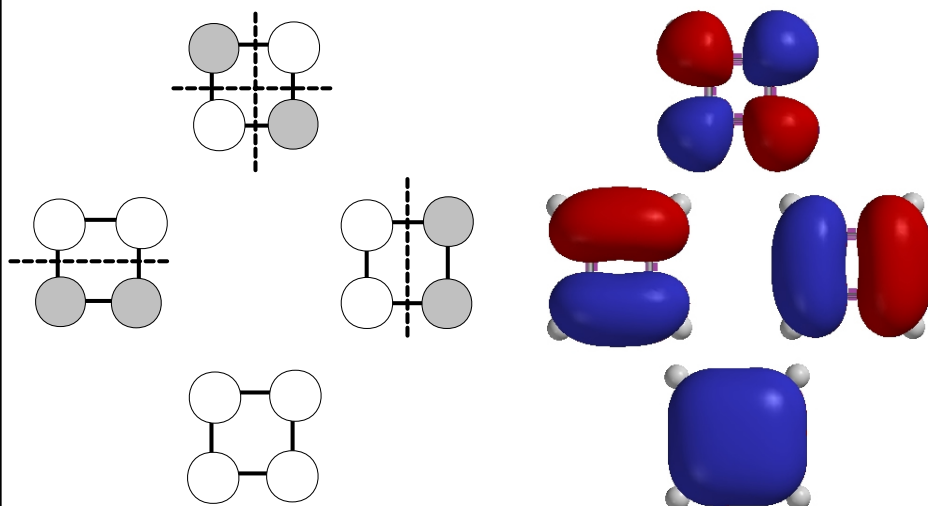
Conjugation in π -Systems: Molecular Orbitals of Benzene and Hexatriene



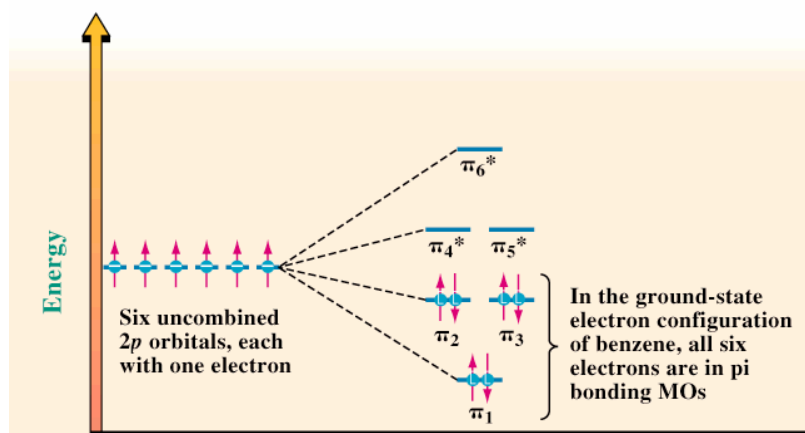
Conjugation in π -Systems: Molecular Orbitals of Benzene



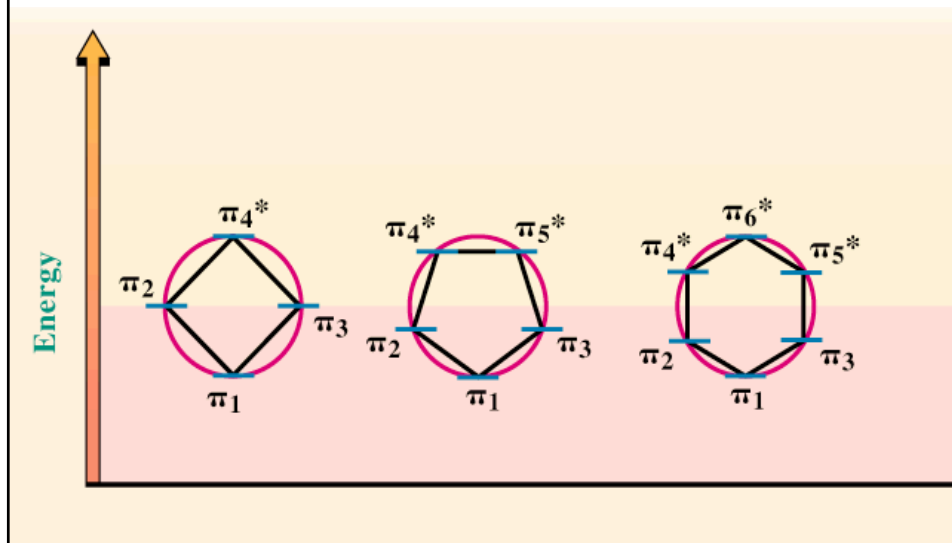
Conjugation in π -Systems: Molecular Orbitals of Cyclobutadiene



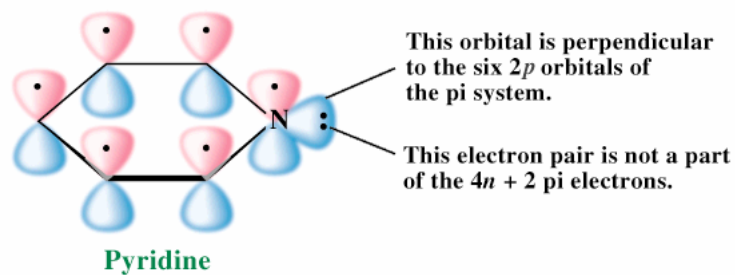
Conjugation in π -Systems: Benzene and Hückel's Rule



Frost circles for 4-, 5-, and 6-membered rings

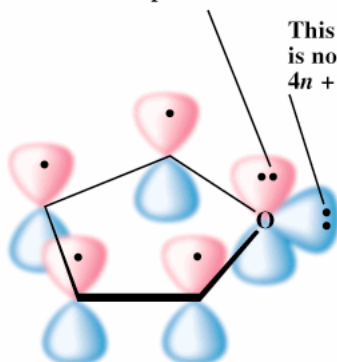


Origin of the $4n+2$ π -electrons in pyridine



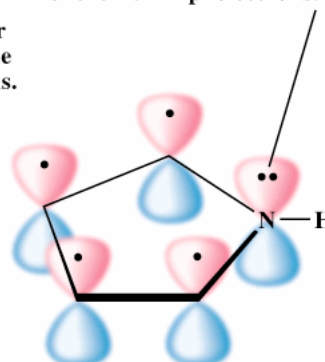
Origin of the $4n+2$ π -electrons in furan and pyrrole

This electron pair is a part of the $4n + 2$ π electrons.



Furan

This electron pair is a part of the $4n + 2$ π electrons.



Pyrrole

Compare geometries: pyrrole and pyrrolidine

