

Resonance

Any molecule that contains two or more adjacent p-orbitals in the same plane can resonate.

- 1) Imaginary structures to represent the extremes of electron location.
- 2) Lewis structures which differ in location of electrons
 - a. Atomic position does not change
 - b. Hybridization does not change
 - c. Involves only pi and nonbonding electrons
 - d. Resonance structures are restricted to the maximum number valence electrons
- 3) Resonance structures do not have to be identical.
- 4) Stable resonance structures have:
 - a. Maximum number of covalent bonds
 - b. Placement of positive and negative charges on the most electropositive and electronegative atom, respectively
 - c. Minimum separation of unlike charges
- 5) The actual structure of a molecule is a weighted average of all resonance structures.
 - a. The more resonance structures a molecule has the more stable it usually is.
- 6) It is possible to interconvert between any contributing resonance structures using a single set of arrows showing the electron motion.