

# Chapter 10

## Chemical Bonding II: Molecular Shapes, Valence Bond Theory, and Molecular Orbital Theory




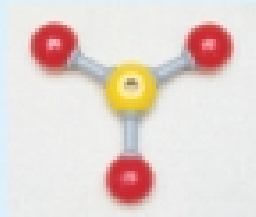


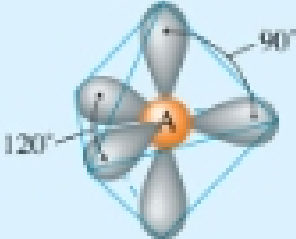

Georgia Gwinnett College  
Chem 1212K  
Fall 2013

# Valence Shell Electron Pair Repulsion Theory

- VSEPR
  - A way of predicting molecular structures from the localized electron model.
  - *The structure around a given atom is determined principally by minimizing electron-pair repulsions.*
    - The lone and bonding pairs should be located as far from one another as possible.
- The geometry is determined by the electron groups of the central atom.
  - The number of electron groups is equal to the sum of the bonded atoms and lone pairs about a central atom.
  - A double/triple bond only counts as 1 bonded atom.

# 5 Basic Arrangements of Electron Groups about a Central Atom

TABLE 13.8 Arrangements of Electron Pairs Around an Atom Yielding Minimum Repulsion

Electron groups	Arrangement of Electron Pairs	Example
2	Linear	 
3	Trigonal planar	 
4	Tetrahedral	 
5	Trigonal bipyramidal	 
6	Octahedral	