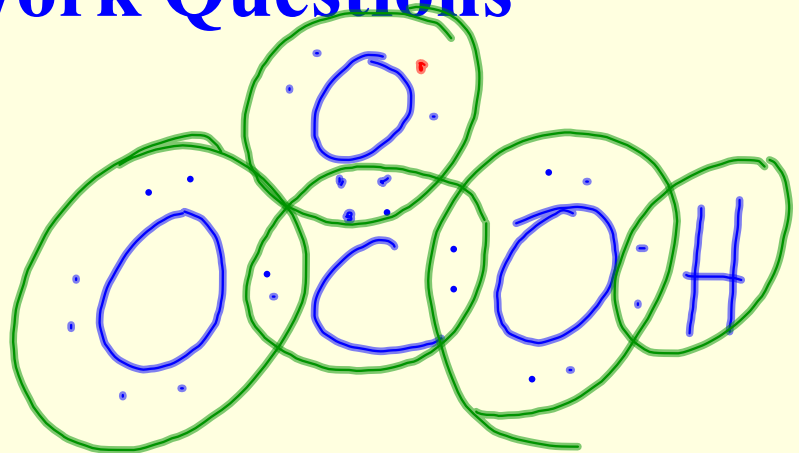
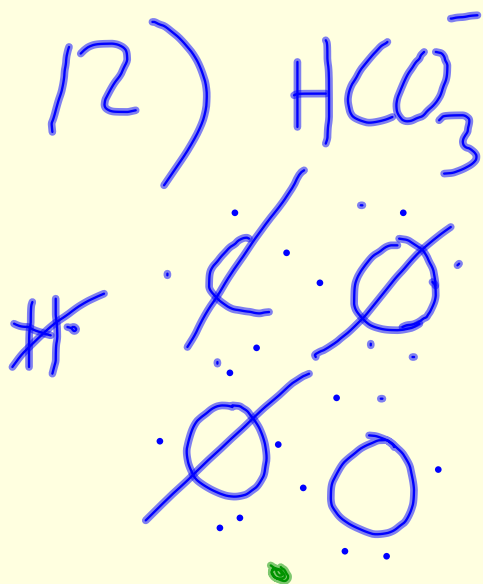


Homework Questions



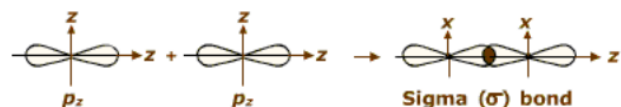
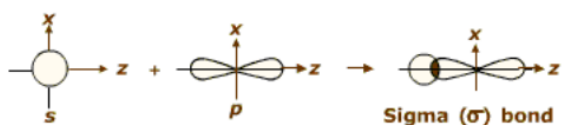
Molecular Orbitals

When two atoms share electrons to form a molecule, their atomic orbitals combine to produce molecular orbitals.

When the orbital is filled with two electrons, it is called a **bonding orbital.**

Sigma bond

Bond that forms when two atomic orbitals overlap head-on.
-strong bond

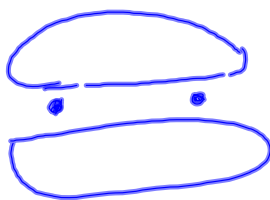
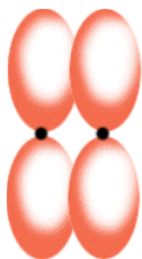


Single bond

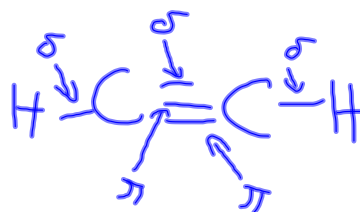
π

Pi bond

Bond that forms when two atomic orbitals overlap side-by-side.
-orbitals overlap less than in sigma bonds, thus the bonds are weaker than sigma bonds.



double
triple
Bonds

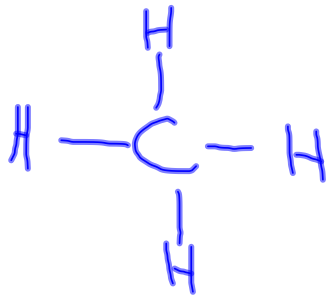


VSEPR Theory

Valence-Shell Electron-Pair Repulsion Theory

Repulsion between electron pairs causes molecular shapes to adjust so that the valence-electron pairs are as far apart as possible.

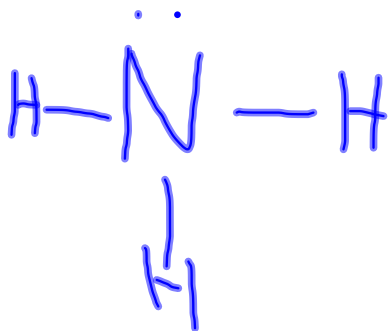
Ex. CH₄



tetrahedral angle (109.5°)

4 shared pairs

Ex. NH₃

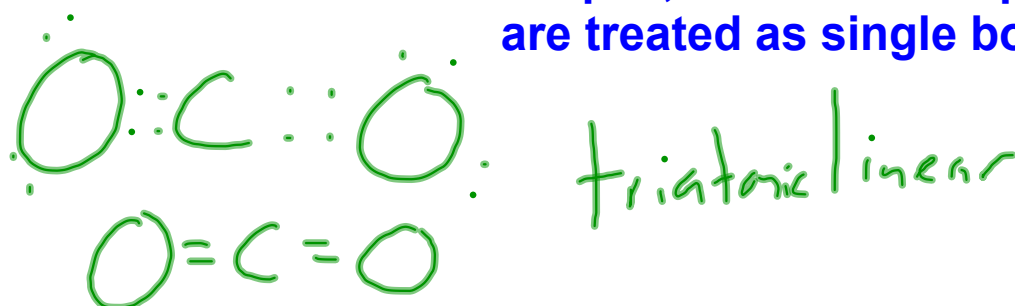


Lone pairs (unshared pairs) also affect the shapes of molecules.

pyramidal
3 shared pairs
1 unshared pair

Ex. CO₂

When predicting molecular shapes, double and triple bonds are treated as single bonds.



Ex. CH₂O

trigonal planar (120°)

