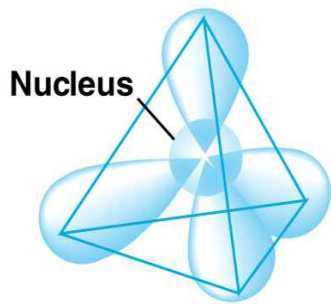
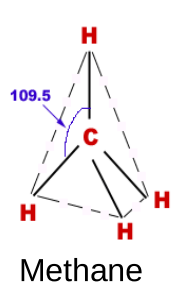


H) Atomic Orbital Diagrams of Carbon

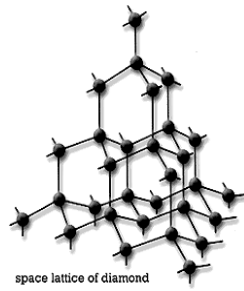
The diagrams are the various orbital geometries of the Carbon atom. They are for the purpose of showing the various three-dimensional arrangements that can occur in Carbon chemistry. These 3-Dimensional structures contribute to the physical, chemical, and biological properties of organic chemicals.



Carbon Atom With Orbitals In Pyramidal Arrangement

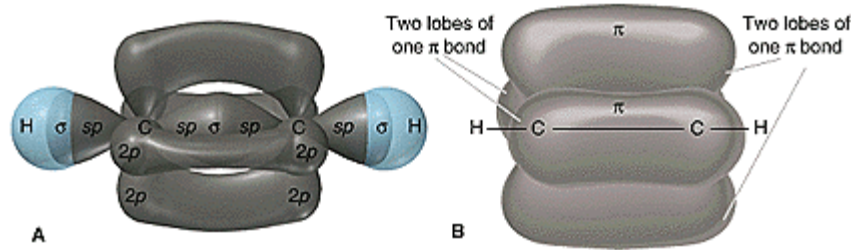


Methane



space lattice of diamond

Carbon Single Bond Arrangement. Tetrahedral in shape. Each Lobe connects to another atom. Diamond is an example of Carbon atoms in this arrangement connected to each other as a lattice. Methane has Hydrogen atoms at the endpoints of each orbital.

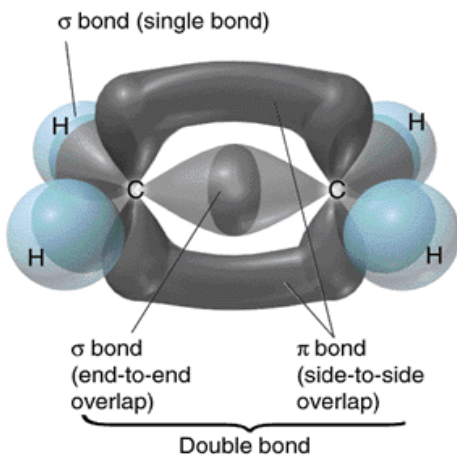


Acetylene

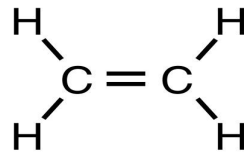


Carbon Triple Bond Arrangement. Linear in shape. In this example, each Carbon has one single bond to a Hydrogen atom, and a shared "triple bond" between them.

The Chemical Shown is Acetylene: C_2H_2

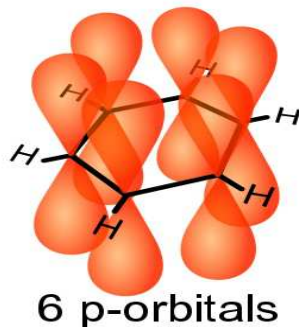


Ethylene

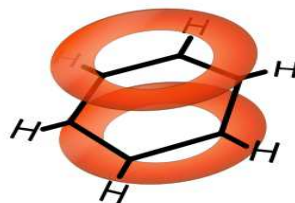


Carbon Double Bond Arrangement. Planar in shape. In this example, each Carbon has two single bonds to Hydrogen atoms, and a shared "double bond" between them.

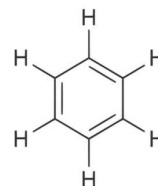
The Chemical Shown Is Ethylene: C_2H_4



6 p-orbitals



delocalized



Benzene

Aromatic Carbon Bond Arrangement. Toroidal in shape. In this example, each Carbon has one single bond to a Hydrogen atom, plus two single bonds to adjacent Carbon atoms. The remaining orbitals of all the carbon atoms "delocalize", or merge, to form a single toroidal shaped orbital above and below the plane of Carbon nuclei.

The Chemical Shown is Benzene: C_6H_6