Bond Lengths and Bond Angles

1. The bond length between two atoms varies little from molecule to molecule.

2. Single bonds to H are ca 1 Å.

3. Single bonds between C, N, O are ca 1.5 Å.

4. Double and triple bonds between C, N, O are ca 1.2-1.3 Å.

Hybridization

More s character more stable: $sp > sp^2 > sp^3$.

Overriding ideas:

(1) Like charges repel, unlike charges attrack
(2) Atoms act so as to fill their valence shell with 8 electrons

These are the "motivations" for chemical structure and dynamics

Chemical reaction is charge atttaction and electron movement.