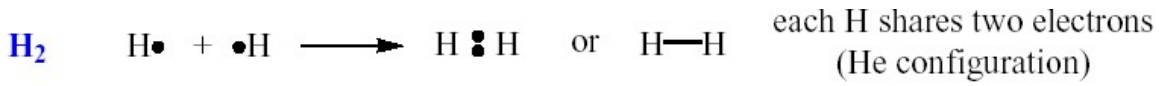
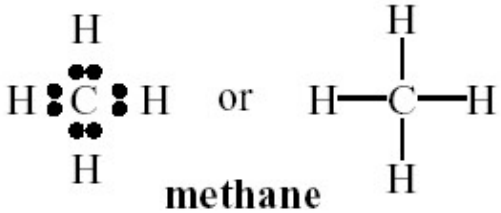
2- Covalent bond.

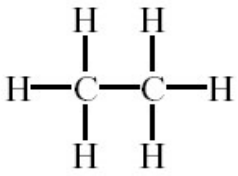
A covalent bond is produced by the sharing of a pair of valence electrons between two atoms.

Atoms achieve noble gas configurations by sharing electrons.

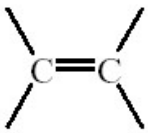




The sharing one pair of electrons between atoms is called a single bond. Two atoms can share two pairs or even three pairs of electrons; these multiple bonds are called double bonds and triple bonds, respectively.

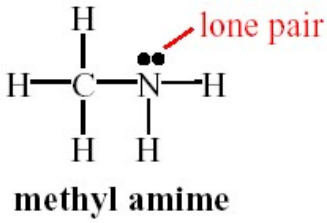


Single bond



Double bond

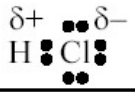
Triple bond



: nonbonding electrons ⇒ affect the reactivity of the compound

3- Polar Covalent Bond.

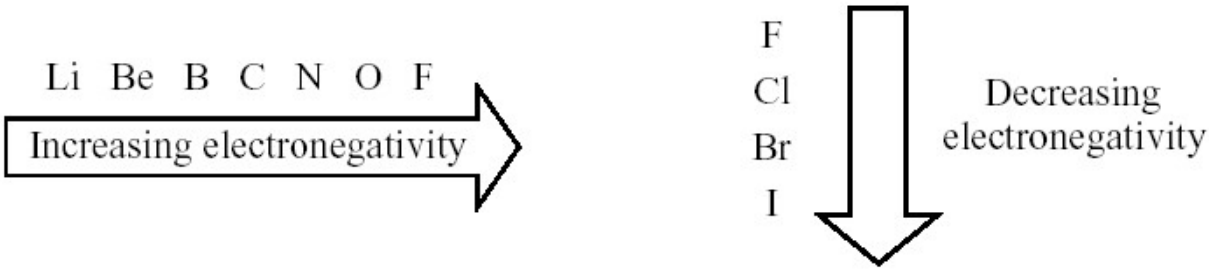
1) When two atoms of different **EN** forms a covalent bond, the electrons are not shared equally between them.
2) The chlorine atom pulls the bonding electrons closer to it and becomes somewhat electron rich ⇒ bears a ***partial negative charge*** (δ–).
3) The hydrogen atom becomes somewhat electron deficient ⇒ bears a ***partial positive charge*** (δ+).



Electronegativity

Is the tendency of an atom to pull bonding electrons toward itself. The bonding electrons in hydrogen chloride, water, and ammonia molecules are more attracted to the atom with the greater electronegativity. This results in a polar distribution of charge.

Electronegativity measures the ability of an atom to attract electrons it is a measure for reactivity.



Electronegativity is affected by the number of protons and the number of shells holding the electrons. The higher number of protons the higher is the attraction for the electrons.

4- Hydrogen bonding

A hydrogen bond is the electrostatic attraction between polar molecules that occurs when a hydrogen (H) atom bound to a highly electronegative atom such as nitrogen (N), oxygen (O) or fluorine (F) experiences attraction to some other nearby highly electronegative atom.

The name *hydrogen bond* is something of a misnomer, as it is not a true bond but a particularly strong dipole-dipole attraction, and should not be confused with a covalent bond

Hybrid orbitals

are mixed orbitals—they result from combining orbitals. The concept of combining orbitals is called orbital hybridization. If the one *s* and three *p* orbitals of the second shell are combined and then apportioned into four equal orbitals, each of the four resulting orbitals will be one part *s* and three parts *p*. This type of mixed orbital is called an (stated "*s*-*p*-three" not "*s*-*p*-cubed") orbital. The superscript 3 means that three *p* orbitals were mixed with one *s* orbital to form the hybrid orbitals. Each orbital has 25% *s* character and 75% *p* character.