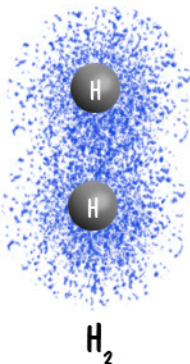


Different Types of Bonds

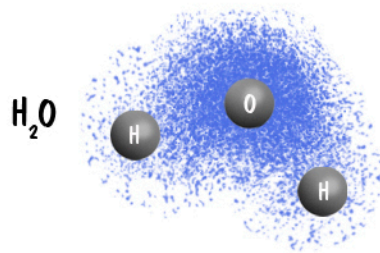
Covalent Bond:

Nonpolar

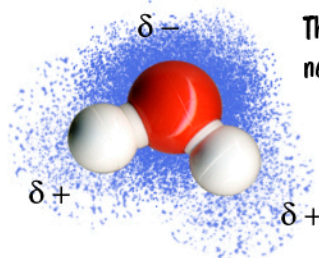


Because electrons move constantly around the nucleus, we can picture this movement as a "cloud". The two Hydrogen atoms are of the same electronegativity, and so they share the electrons equally.

Polar



Because Oxygen is more electronegative than either Hydrogen, the shared electrons are pulled much closer to the Oxygen.

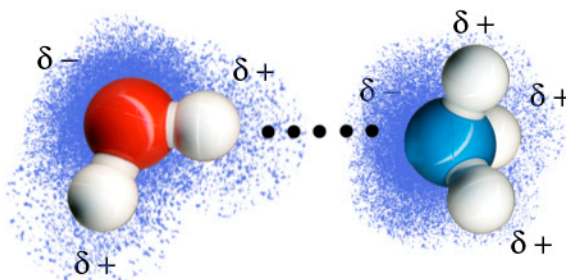


This gives the Oxygen a partial negative charge (labeled δ^-)

and a partial positive charge to the Hydrogens (labeled δ^+).

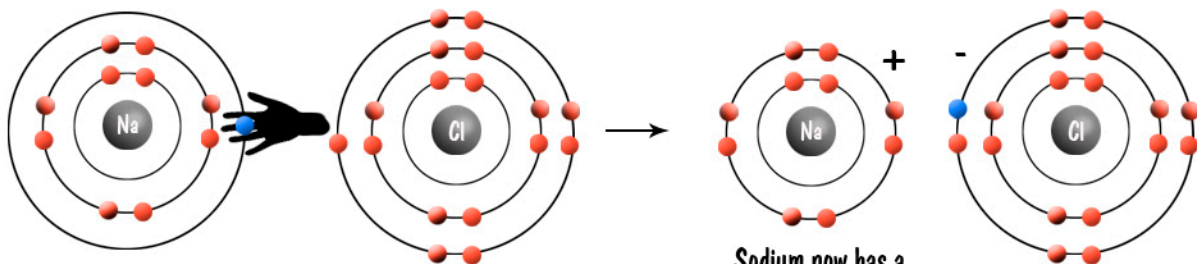
Hydrogen Bond:

A Hydrogen bond forms when a hydrogen atom covalently bonded to one electronegative atom is also attracted to another electronegative atom. These bonds are crucial in protein structure formation and stability.



Ionic Bond:

Sometimes the two atoms are so unequal in their attraction for valence electrons, the more electronegative atom strips away the electron to fill its valence shell rather than share it. The classic example of this is salt.



Sodium now has a complete valence shell and a charge of + 1

Chlorine has a complete valence shell and a charge of - 1

Many Sodium and Chloride IONS bond to form a strong crystalline lattice.

Van der Waals Interactions:

Even in non-polar covalent bonds, there is movement of electrons, and so areas fluctuate between slightly more positive or slightly more negative. Molecules have to be very close together in order for bonding to occur, as in protein folding where non-polar sidechains are buried in the inner areas of the protein due to their hydrophobic nature.

