Chapter 10- Molecular Mixing and The Mole

- Submicroscopic Particles
 - Substances are made of submicroscopic particles
 - Ionic compounds
 - Made up of ions
 - Covalent compound
 - Made up of molecules
 - Elements
 - Made up of atoms
- · Electrical attractions between submicroscopic particles
 - Dipole- separation of charge
 - Ex. Water molecule, have a slightly opposite and negative side
 - Opposite charges attract one another
 - > Ex. Polar molecule (water) when in the presences of the ionic compounds
 - The positive ion is attracted to the negative end of the molecule
 - negative ion is attracted to the positive end of the molecule
 - This is called an Ion-dipole attraction
 - Too many ion dipole attraction will disrupt the ionic bond
 - > Ex. NaCl in H2O the water separates the NaCl and forms and Aqueous solution --> a solution in water
- Polar Molecule attracts polar molecules
 - dipole-dipole- An attraction between 2 polar molecules ex. water
 - Ex. water
 <u>Hydrogen Bond</u>- the attraction between hydrogen and the negatively charged tomotral other molecule (oxygen)
 <u>he Hydrogen Bond</u>
 The strength of a H bond depends on
 1. The strength of the dipoles involved
 2. How strongly nonbonding e- op one monecule can attrace a H atom on another molecule
- The Hydrogen Bond

 - - A H atom on another molecule
- Importance of the H bond
 - Gives water many of it
- Found in DNA are issolving carbohydrate
- Dissolving by the second seco
 - It is the <u>solvent</u>
 - The other components the solutes
 - > EX. Sugar mixed with water
 - Water- solvent
 - Sugar-solute
 - Dissolving the mixing of a solute in solvent
 - Saturated solution- the solvent (water) cannot accept anymore solute (sugar)
 - Unsaturated solution- it can accept more solute
- Solubility
 - Solubility- the ability of a solute is its ability to dissolve in a solvent
 - Insoluable- a material that does not dissolve in a solvent
 - Ex. Insoluble in water: sand and glass
 - Just because a material isn't soluble in one solvent, doesn't mean it won't dissolve...
 - Ex. Sand and glass are solvable in hydrofluoric acid
 - Ex. Hydrofluoric acid is used to give frosted the decorative look
 - > Ex. Styrofoam is insoluble in water, but solvable in acetone
- Solubility and temperature
 - solubility increases with increasing temperatures
 - Hot molecules have greater kinetic energy and can collide with the solid solute with more force
 - Solids
 - > Ex. Sugar (sucrose), heat to almost a boil
 - This is how syrup and hard candy are made
 - Gases
 - Solubility of gases in liquids decrease with increasing temperatures
 - Particles are moving too fast
 - > This is why warm carbonated drinks (soda) go "flat" faster than cold
 - High temp. Makes the molecules of CO₂ gas leave the drink faster