**Solutions**

There are 2 parts to a solution

1) Solute – being dissolved

2) Solvent – (usually water) dissolving the solute

EX.)  NaCl(aq)  NaCl - solute

                           H2O – solvent

**Reminder:** When an ionic compound (salt) is dissolved in water, it disassociates (breaks apart) into a positive and negative ion.

**Properties Of Solutions**

1)      Solutions are homogenous mixtures (physically combined) (broken down)

2)      Solutions are clear and do not disperse light

3)      Solutions can have color

4)      Solutions will not settle on standing

5)      Solutions will pass through a filter

**Solubility**

-          Ability for a solute to dissolve in a solvent

**Soluble** = Will dissolve

**Insoluble** = Will not dissolve

-          Polarity has a lot to do with solubility “Like dissolves Like”

-          Polar solvents dissolvepolar solutes

-          Non-Polar solvents dissolve Non-Polar solutes

**Solid Dissolved In A Liquid**

**Soluble** – Will dissolve

**Insoluble** – Will not dissolve

Increase in temperature = increase in solubility

Pressure = NO EFFECT

**Liquid Dissolved In A Liquid**

**Miscible** = Will dissolve

**Immiscible** = Will not dissolve

Increase in temperature = increase in solubility

Pressure = NO EFFECT

**Gases Dissolved In Liquid (Think Of Soda)**

**Soluble** = Will dissolve

**Insoluble** = Will not dissolve

Decrease in temperature = Increase in solubility

**PRESSURE ONLY EFFECTS GAS**

**Solubility Curves**

-          Most of the curves on table G are solids and liquids dissolved

-          3 curves represent gases ( So2, NH3, HCl) because increase in temperature means decrease in solubility of a gas.

**Unsaturated** – The solvent has the ability to dissolve more solute. (Below The Given Curve)

**Saturated** – The solvent has dissolved the maximum amount of solute at a given temperature.

When identifying a saturate, solid must be present on the bottom of the container in order to conclude that the solution above the precipitate (Solid on the bottom of the beaker) is saturate.

**Supersaturated Solution** – Is a solution which the solvent is holding more solute than expected at a given temperature because it was heated and then cooled. (Above The Given Curve)

**Solution** = Solute and Solvent

**Concentration**

Molarity = M      M = Moles of Solute

                                     Liter Of Solution

**Moles Of Solute** =  Number of Moles

                                                          GFM

**Liter Of Solution** =  mL(1000) = 1 L

Percent By Volume

Percent By Volume = volume of solute x 100

volume of solution

D=M/V **mL = 1g (Water)**

**Parts Per Million**

**PPM** = Grams Of Solute / Grams Of Solution x 1,000,000

**Practice Problems**:

What is the molarity of a solution that contains Na(.5L) of a solution = (4 Moles)

Moles Of Solute / Liter Of Solution = 4 / .5 = 8M

What is the molarity of a solution containing 82 grams of CaNO3(2) and 2 Liters of a solution

Given Mass / GFM = 82 / 164 Ca = 40 N = 14 x 2 = 28 O = 16 x 6 = 96

.5 / 2 = Moles Of Solute / Liter Of Solution = .25M

What is the percent by mass Sodium Hydroxide if 2.5 grams NaOH are added to 50grams of water?

Part/Whole x 100            2.5/50 x 100         2.5/52.5 x 100 = 47

What is the percent by volume of alcohol 50Ml of ethanol is dilated with 300mL of water

50mL --- 50g

300mL --- 300g                 50/350 x 100      14.28 --- 14%