

## Chemistry Chapter 8 – Ionic Reactions in Solution

In order to have metathesis, must have **driving force of precipitate, weak electrolyte, or gas.**

Precipitates form when ion concentrations are large enough to make the reaction mixture supersaturated

Salt is insoluble if a precipitate will form even in the concentrations of ions are small. **Know solubility rules/gases**

In order to synthesize materials, must form water, solid, or gas. **When desired product is insoluble, use precipitate**

Both reactants must be soluble, but one desired can't be soluble. When desired is solution, pay attention to amount used

**Another way is Acid/Base Neutralization.** In neutralization, when dealing with quantity, **make the soluble one the limiting reactant.**

To make inorganic salts, react acid and metal carbonate, carbonate turns into gas.

Concentration – to express concentration, use percentage, ppm, molarity, normality,

To convert from **mL to grams** and vice versa, use the **DENSITY formula (mass/volume)**. Ppm is  $\% * 10^6$

**% composition** – use 100 grams total (if 5%, then 5 grams solute, 95g solvent).

**Molarity** – FIND THE BALANCED CHEMICAL FORMULA FIRST. Use coefficients. # of moles \* Molarity = conc

.240M solution of  $Al_2(SO_4)_3$ . Al concentration =  $.240 * 2 = .480$  M.  $SO_4$  concentration =  $.240 * 3 = .720$  M

Recall how to solve normal **stoichiometry** problems. If you forgot, review chapter 2. If you forgot molarity, read Ch 2

To change from moles to mL or vice versa, use proportion of moles/1000mL or 100mL/moles. **Watch limiting reactants**

Pay attention to concentrations when going from moles to mL. If you got .500M  $CaCl_2$ , the  $Cl^-$  concentration is 1.00M!

When asking ion concentration after reaction finishes, add the two mL values. **Read example 8.15 on page 292**

**Chemical analysis** – experimental determination of chemical composition. Read 8.16 on Page 293

Remember that moles usually react in equal numbers. If you react 5 moles of  $SO_4$ , you'll get back 5 moles of  $SO_4$

For Titration, ALWAYS GET A BALANCED EQUATION. When calculating %, find moles, then grams, then %

**# of eq = n \* number of moles**

**equivalent weight = mass of 1 mol/n**

**normality = number of equivalents/1 liter of solution**

**Normality = n \* Molarity**

**VN = VN**

For equivalents, find the ratio in which the two can be converted assuming 1 equivalent weight, then use proportion

In Redox, n = total number of electrons exchanged

Normality gets you equivalents, Molarity gets you moles

**Equivalents – Find n, find equivalent weights, proportion it**

**Molecules such as  $Cr_2O_7^{2-}$  exchange 6 e-**

When dealing with equivalents and electrons, watch for molecules with 2 or 3 bound together

To prepare solution of given molarity, find the number of equivalents/mole, then proportion with number of total equivalents,

then multiply by formula weight to get grams. **WATCH OUT FOR UNITS. MAKE SURE THEY'RE THE RIGHT ONES**

Also remember that electron transfer of 1 or 2 electrons means 1 mol produces 1 or two equivalent moles, can be used.

The sum of all the equivalent weights equal the molecular weight

For all conversions, even if it can be done in head, USE PROPORTION

How can you tell if something's a weak electrolyte or a solid?  $Mg(OH)_2$ ,  $Mn(OH)_2$ ,  $BaCl_2$