Ch 22 Acids, Bases and Salts

1. Acids and Bases
2. *Acids*- formula starts with at least one hydrogen that ionizes when mixed with water
3. H+ ion combines with water to make a *hydronium ion* (H3O+)
4. Properties
	1. Taste sour
	2. Corrodes metal making hydrogen gas
	3. Turns *indicators* color – organic compound that changes color due to acid or base
		1. Litmus- red
		2. Phenolphthalein- clear
5. Common Acids- memorize

1. Strong Acids

a. HCl- hydrochloric acid- stomach acid

b. HNO- nitric acid- makes explosives

c. H2SO4- sulfuric acid- battery acid

 2. Weak Acids

 a. HC2H3O2 – acetic acid- vinegar

 b. H2CO3- carbonic acid- carbonated water (soda)

 C. *Bases*- substance that forms *hydroxide ion* (OH-) in water

 1. Properties

 a. taste bitter

 b. feel slippery

 c. corrosive- eat away metal

 d. turn indicators colors

 1) litmus- blue

 2) phenophthaline- pink

 D. Common Bases- memorize

 1. Strong Bases

 a. NaOH- sodium hydroxide- make soap, drain cleaner

 b. KOH- potassium hydroxide- make soap

 c. Mg(OH)2- magnesium hydroxide- milk of magnesia

 2. Weak Bases

 a. (NH4)(OH)- ammonium hydroxide- household ammonia

 b. Bi(OH)3- bismuth hydroxide- in pepto bismol

 E. Dissociation/ ionization- ions separation base or acid

 1. More complete dissociation- strong acid or base

II. Strength, Concentration, and pH

 A. Strength – depends on how completely an acid or base separates into ions

 1. *strong acid* – ionizes completely in water

 2. *weak acids* – incomplete ionization in water

 a. safer to touch and in many foods

 b. chem eqn uses a double arrow

 3. *strong base* – dissociates completely in water

 4. *weak bases* – incomplete dissociation

 B. Concentration- how much acid or base is in given amount of water

1. Concentrated- lots acid or base
2. Dilute- little acid or base
3. Concentration and strength not relate

C. pH- measure of concentration of hydrogen ions in solution

1. measures strength of acid or base
2. measured with pH paper, liquid indicator, or pH meter
3. pH scale: numbers 0-14
	1. pH= 7 neutral solution- neither acid nor base (pure water)
	2. lower pH – stronger acid
	3. higher pH- stronger base
4. Buffer- substance that keeps pH from changing easily
	1. In blood, which must maintain pH between 7.0 and 7.8

III. Salts- metal from base and nonmetal from acid

1. Neutralization- adding acid and base to make salt and water

1. Complete neutralization makes pH= 7

 B. Many Kinds of Salts

 Ex) KNO3- potassium nitrate- saltpeter- ingredient in gun powder

 CaCO3- calcium carbonate- chalk

*Titration*- adding acid and base for complete neutralization

1. if know concentration of either acid or base, can find conc. of other

2. endpoint- when indicator turns color- happens at complete neutralization

D. Soaps and detergents

 1. Soaps – organic salts (Ch21)

 a. saponification- base + fat make soap ( KOH or NaOH)

 b. don’t work well in hard water

 2. Detergents- work well in hard water