Chemistry Regents: Acids, Bases and Salts Review Sheet Unit 11

Properties of acids

- Sour taste
- Electrolytes
- Cause acid-base indicators to change color (table M)
- Blue litmus turns red
- React with bases to produce water and a salt
- React with metals to produce hydrogen gas
  (Table J: exceptions Cu, CU, and AG)

Properties of bases

- Bitter taste
- Slippery
- Electrolytes
- React with acids to produce water and a salt
- Cause acid base indicators to change color

Acid Nomenclature

- Acids always begins with "H"
- If two elements (H and another element)
  - You must use hydro- "stem"- ic acid
- If three or more elements (H + polyatomic ion)
  - You don't use "hydro", just change the ending to the polyatomic ion and acid
  - If ending is –ate then change to –ic acid
  - If ending is –ite then change to –ous acid

Definitions of acid

- Arrhenius:
  - Properties of acids are based on properties of hydrogen ion or hydronium ion
  - Acids produce H+ ions while bases produce OH- ions
- Bronsted-Lowery
  - Changed Arrhenius' definition to make more broad
  - Acids donate H+ ions while bases accept H+
  - Not all bases contain -OH ending so be careful
    - NH_3 is a base
    - C-OH are alcohols not bases
    - -COOH are organic acids not bases

pH scale

- Below 7 is acidic, above 7 is basic, 7 is neutral
- Each change in a single pH is a ten-fold change
- [H+] + [OH-]= 14, so if you goes up the other goes down
- pH = molarity, raise 10 by the negative pH: 10^{-pH}

pH testing and indicators

- litmus paper (blue "basic", red acidic)
- pH paper
- phenolthalein = clear → pink means basic
- Table M lists other with ranges

Strong Vs Weak Acids and Bases

- Strong acids completely dissociate in water
- Weak acids do not completely dissociate in water
- Strong bases and weak bases act in the same manner

Acid reaction with metals

- Table J: only metals above hydrogen will react with acid to produce hydrogen gas
- Acid + metal →hydrogen gas (H_2) + salt (metal-nonmetal)
- Single replacement reactions

Neutralization reactions

- Acid + base→water + salt
- Double replacement reactions
- [H+]ions = [OH-] ions

Titration

- When a known acid or base solution is used to figure out an unknown acid or base solution
- Add a measured amount of an acid or base of known concentration to an unknown acid or base to use formula $M_aV_a=M_bV_b$
- There should always be a 1:1 ratios between [H+] ions and [OH-]
- Reference table formula
    - Molarity = moles/liters
    - Moles of substance = given mass/gram formula mass
    - Moles of [H+] = number of H's in compound X moles of acid

Acids	**Base**
H+	OH-
Proton donor	Proton acceptor
pH 0 up to 7 (not equal to 7)	Great than 7
H+ nonmetal	Metal +OH, be careful not all end in OH
a.k.a. hydronium H_3O	a.k.a. alkaline