CHM 161 Exam II Study Guide

CH 5 – Molecular Compounds

Covalent bonding

- Octet rule
- bonding tendencies of different atoms
- similarities between elements in the same group
- Lewis structures
- Be able to draw Lewis structures from molecular formulas or from partially drawn structures
- geometries of compounds based on the structure
- Naming covalent compounds (P_2O_5 e.g.)

CH 6 – Chemical Reactions – Classification and Mass Relationships

- Balancing chemical equations (crucial)
- Molecular weight
- Mole concept; number of atoms/molecules in a mole (Avogadro)
- Mole to mole conversions (using balanced equations)
- Mole to gram conversions (using molecular weights)
- Gram to gram conversions (using both)
    - g reactant -> mol reactant -> mol product -> g product
- classes of chemical reactions:
    - acid-base neutralization
    - precipitation
        - net ionic equation
    - oxidation-reduction
        - oxidation numbers of atoms within molecules
        - what is oxidized, what is reduced
        - oxidizing agent, reducing agent

CH 7 – Chemical Reactions - Energy, Rates and Equilibrium

- Free Energy (ΔG), Enthalpy (heat of reaction, ΔH), entropy (ΔS)
- Kelvin Temperature scale
- Solving problems using $\Delta G = \Delta H - T\Delta S$
- Equilibrium equations for a reaction and Equilibrium constants
    - Solving problems using equilibrium equations
- LeChetalier's Principle – putting stresses on reactions at equilibrium
    - Pressure, temperature, changing concentrations