Study Guide for Exam #3 (Ch. 7-9)

Chem20, Elementary Chemistry

MEMORIZE

- Classifications by products (precipitation, acid-base neutralization, gas evolution, oxidation)
- Classifications by atoms (single displacement, double displacement, synthesis, decomposition)
- Acid-Base Neutralization: acid + base → water + salt
- Combustion Reaction: (C + H) OR (C + H + O) + $O_2(g) \rightarrow CO_2(g) + H_2O(g)$
- Percent Yield= $\frac{\text{actual yield}}{\text{theoretical yield}} \times 100\%$
- Speed of light = wavelength x frequency ($c = \lambda \times \nu$)
- Energy = Planck's constant x frequency ($E = h \times \nu$)
- Electronic configuration: 1s 2s 2p 3s 3p 4s 3d 4p 5s 4d 5p 6s 4f 5d 6p 7s 5f 6d 7p

Chapter Seven

I. Balancing Chemical Equations (7.3-7.4): Know how to balance any chemical equation.
Ex., Ch. 7: 35-38, 41-58

II. Precipitation Reactions (7.6-7.7): Know how to use the solubility guidelines to predict whether a precipitation reaction will occur. Know how to write the molecular, total ionic, and net ionic equations for any double displacement reaction.
Ex., Ch. 7: 65-78, 95-98

III. Acid-Base Neutralizations, Gas Evolution Reactions (7.8): Know how to predict the products for acid-base neutralizations and gas evolution reactions.
Ex., Ch. 7: 79-84, 97-98

IV. Combustion Reactions (7.9): Know how to predict the products for combustion reactions.
Ex., Ch. 7: 87-88

V. Classifications of Reactions (7.10): Know how to classify any chemical reaction by product or by movement of atoms.
Ex., Ch. 7: 91-92

Chapter Eight

I. Stoichiometry (8.3-8.4): Know how to use balanced chemical reactions to convert between masses of reactant to product, product to reactant, or reactant to product.
Ex., Ch. 8: 27-30, 35-36, 39-42

II. Limiting Reactant and Percent Yield (8.5-8.6): Know how to identify the limiting reactant when given multiple, finite amounts of two reactants. Know how to calculate the theoretical yield. Be able to calculate the actual, theoretical, or percent yield for a reaction when given the other two.
Ex., Ch. 8: 47-50, 55-68, 87-90

III. Enthalpy (8.7): Know how to use the sign of the enthalpy of a reaction to classify it as endothermic or exothermic. Know how to use ΔH_{rxn} to calculate the heat gained or released in a reaction.
Ex., Ch. 8: 69-70, 73-76

Chapter Nine

I. Nature of Light (9.2-9.3): Know how to convert between energy, wavelength, and frequency for any electromagnetic radiation.
Ex., Ch. 9: 29-30, 103-105

II. Electron Configuration (9.6-9.7): Know how to write the electronic configuration for any element on the periodic table. Know how to distinguish between core and valence electrons.
Ex., Ch. 9: 49-76, 93-95, 97-98

III. Periodic Trends (9.9): Know how to use periodic trends to predict atomic size, ionization energy, and metallic character between sets of elements.
Ex., Ch. 9: 77-88