CH 221 Chapter Two Part 2 Study Guide

- Define molecular formula, empirical formula and structural (or "condensed") formula and know how to use them. Define allotropes and give several examples.

- List the elements that exist as diatomic molecules and be able to predict which elements are monatomic (Noble gases).

- Understand the definitions of cation (positive charge) and anion (negative charge). Metals are usually cations (lose electrons) while nonmetals will often be anions (gain electrons).

- Understand the "quick and dirty" ionic charge guide for predicting the ionic charges on atoms in groups 1A-3A and 5A-8A. Recognize that transition metal elements often exist in a variety of positively charged "oxidation" states.

- Be able to give the names, formulas and ionic charges for the polyatomic ions listed in the textbook and in the Nomenclature lab.

- Be able to write the formulas for a number of ionic compounds using groups 1A-3A and 5A-7A.

- Explain the general properties of ionic compounds. Understand the importance of Coulomb's Law and how it relates to electrostatic forces. We will be revisiting this concept in CH 222.

- Be able to determine the name of an ionic (metal plus nonmetal) or covalent (nonmetal plus nonmetal) compound using the rules outlined in this chapter.

- Understand the concepts of formula mass and molar mass (i.e. molecular weight) and how they relate to the mole and Avogadro's number. Be able to calculate the molar mass for *any* given compound. Master the skills necessary to convert moles to grams and grams to moles.

- Understand and be able to use percent composition in relation to empirical formulas.

- Understand the difference between empirical and molecular formulas and what is needed to calculate the molecular formula from an empirical formula (i.e. a molar mass determination such as from mass spectrometry).

- Be able to use experimental data to calculate the number of water molecules in a hydrated compound.

- Be able to solve and understand the assigned problems in problem set #3.