CHM151 Fall 2009 Final Exam Review

Chapter 1:
- Physical and chemical properties of matter
- Significant Figures
- Unit conversion/ Dimensional analysis

Chapter 2:
- Structure of the atom (atomic number, mass number, # protons, # electrons, # neutrons)
- Isotopes
- Naming: ionic compounds (including the Stock system), covalent compounds
- Predicting formulas for ionic compounds

Chapter 3:
- Percent composition of compounds
- Determining empirical formula
- Avogadro's number, molar mass, molecular mass (calculations)
- Balancing chemical equations
- Amounts of reactants and products (Stoichiometry)
- Limiting reagents (calculations)

Chapter 4:
- Properties of solutions (what happens to ionic compounds in H_2O?)
- Concentration of solutions (and ions in solution)
- Dilution of solutions
- Molecular equations, ionic equations, and net ionic equations (solubility rules, doubledisplacement reactions)
- Acid-base titrations (calculations)

Chapter 5:
- Kinetic Molecular Theory of gases (how article speed varies with temperature and molar mass)
- The Ideal Gas equation ($PV=nRT$)
- Dalton's Law of Partial Pressures
- Gas stoichiometry

Chapter 6:
- Enthalpy of chemical reactions (stoichiometry calculations)
- Enthalpy of chemical reactions (predict endothermic and exothermic reactions)
- Calculating Enthalpy (from Heats of formation or using Hess's Law)
- Calorimetry ($q=ms\Delta T$)

Chapter 7:
- Electromagnetic radiation (E, λ, ν)

- Electromagnetic radiation (calculations)
- Calculating energy for electron transitions (Rydberg Equation)
- Quantum numbers (n,l,m_l,m_s AND l values for s,p,d,f)
- Electron configurations for atoms and ions
- Diamagnetism and Paramagnetism

Chapter 8:
- Periodic trends: Ionization Energy
- Periodic trends: Atomic radii

Chapter 9:
- Predicting ionic bond vs. covalent bond
- Lewis Structures (including exceptions)
- Bond Enthalpy Calculations

Chapter 10:
- Molecular geometry
- Hybridization of atomic orbitals
- Hybridization of molecules with double/triple bonds
- Sigma/pi bonds

Chapter 11:
- Intermolecular forces
- Relationship between IM forces and boiling/melting points
- Vapor pressure: what is it? What does it tell you about IM forces?
- Interpret heating curves
- Heating Curve Calculations
- Interpret Phase diagrams

Chapter 12:
- Solubility: predict which solutes will be soluble in which solvents
- Calculate mole fraction
- Effect of solute on colligative properties (vapor pressure, bp, fp, osmotic pressure)
- Calculate freezing point depression/boiling point elevation