CHEM 1115 – Fall 2021
Final Exam Study Guide

This study guide is meant to be only a guide as you study. Please review the material and questions from the lab manual rather than just relying on this guide. Equations and tables, for example, are found in the lab manual rather than in this guide.

Lab 1: Measurement and Glass-Bending

- As a matter of safety, remember that glass cools down slowly and hot glass looks just the same as cool glass
- Volume measurements should be taken from the bottom of the meniscus
- Volumes can be estimated to one significant figure beyond the graduation marks

Lab 2: Density

- Significant figure rules – see your textbook
- Density from mass and dimensional measurements
- Measuring density from mass and displacement volume
- Layering of immiscible liquids
- Density of mixed solutions can be surprisingly high (water/ethanol mixture)

Lab 3: Atomic Identification

- Quantum mechanical explanation for atomic emission and absorption lines
- Identify an atom based on an observed color and a table of absorption/emission colors

Lab 4: Chemical Formulas

- Difference between empirical and molecular formulas
- Determine stoichiometric ratio from yield of precipitation reactions
- Determine stoichiometric ratio from gravimetric analysis of an oxidation reaction

Lab 5: Chemical Names and Structures

- Write chemical formulas from chemical names
- Give chemical names from chemical formulas (molecular and ionic)
- Identify molecular geometry
- Identify polar bonds and net molecular polarity

Lab 6: Chemical Reactions

- Solubility rules
- How to recognize a chemical reaction
- Classifying chemical reactions

Lab 7: Stoichiometry

- Calculating % mass of copper in copper compounds based on the chemical formulas
- Finding % mass of copper in a sample by reducing copper ions to copper metal

Lab 8: Chemical Equilibrium and Le Châtelier's Principle

- Response of a system to addition/removal of a reactant or product
- Response of a system to temperature changes (endo/exothermic reactions)
- Response of a system to pressure changes
- Use of a syringe to change the pressure on a system

Lab 9: Collection of Hydrogen Gas

- Calculating moles of gas from the ideal gas law
- Dalton's law of partial pressures
- Vapor pressure of water
- Proper use of a eudiometer
- % yield from theoretical and actual yields

Lab 10: Electrolytes

- Definition of strong and weak electrolytes
- Identifying strong and weak electrolytes from conductivity
- Identifying strong and weak electrolytes from a gold nanoparticle solution

Lab 11: Acid-Base Chemistry

- Finding pH from $[H_3O^+]$
- Finding $[H_3O^+]$ from pH
- Identifying acidity using color indicators (litmus paper and indicator solutions)
- Other tests for acidity (Mg and $Ca(OH)_2$)
- Sodium and Chloride qualitative tests