

Midterm Review Chem 002 – FS09

1. MSDS and Safety

- a. Know the MSDS information for the first five experiments.

Zinc: HCl, Zinc & (implications of Bunsen burners)

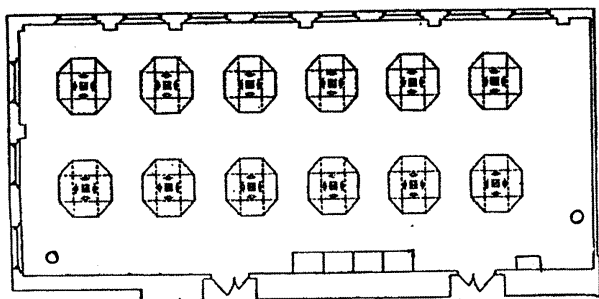
EF: Aluminum, Copper, Copper Chloride, HCl & (implications of Bunsen burners)

TM: NaCl, SiO₂, CaCO₃, HCl, K₂CO₃

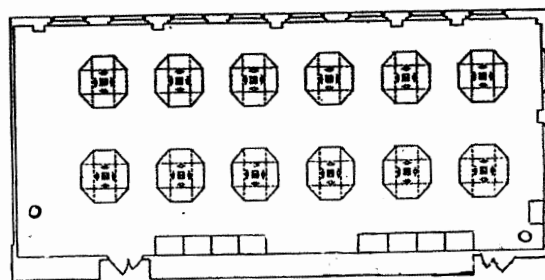
13 TT: NH₃, Ba(NO₃)₂, Cu(NO₃)₂, Fe(NO₃)₃, NiSO₄, K₂CrO₄, KNO₃, K₂C₂O₄, KSCN, NaCl, Na₂S, H₂SO₄, SnCl₂

- b. **Room Diagram** – Be able to label equipment in your room.

Balances, Distilled Water, Exits, Fire Extinguishers, Hoods, Safety Blankets, Safety Showers, Waste Containers



Room 201



Room 212

2. Determining the Thickness of a Coating

- a. Read over *Statistical Analysis of Zinc Coated Washers* – pp. 51-70.
- b. Know how to determine the volume of a coating based on the mass and density of the coating.
 $V = m / d$
- c. Know how to determine the surface area of the item, if given the SA equation for that shape.
- d. Know how to determine the thickness of the coating from the volume and the surface area.
thickness = volume / surface area
- e. Be able to determine the percent error, if given the expected thickness of the coating.

3. Statistical Analysis

- a. Read over *Statistical Analysis of Zinc Coated Washers* – pp. 51-70.
- b. Know Equations 1-5 and know the names of each equation.
1. Average or mean: $\bar{x} = \sum x_i / n$ where n is the number of entries
 2. Standard Deviation: $\sigma = [\sum (x_i - \bar{x})^2 / n]^{1/2}$ Recall: squareroot $x = x^{1/2}$
 3. Estimate of the Standard Deviation: $s = [\sum (x_i - \bar{x})^2 / (n-1)]^{1/2}$
 4. Confidence Interval (CI) for a single value: $CI_{\text{single}} = \pm ts$
 5. Confidence Interval (CI) for the mean: $CI_{\text{mean}} = \pm ts / (n^{1/2})$
- c. Know the differences between equations 2-3 and 4-5 and when each of these equations is applicable.

4. The Empirical Formula of a Compound

- Read over *Determining the Empirical Formula of Copper Chloride* – pp. 71-82.
- Know how to determine the percent composition of a compound, if given initial and final masses.
- Be able to determine the empirical formula of the compound by determining the formula weights and mass percents of compounds.

5. Separating Components of a Mixture

- Read over *Separating the Components of a Ternary Mixture* – pp. 83-102.
- Be able to make a flowchart if given a table of components in a mixture.
- Know how to determine the percent of each of the components in the mixture.
- Know how to determine the percent recovery and the percent error of the overall composition.

6. Mystery of the Thirteen Test Tubes

- Read over *Mystery of the Thirteen Test Tubes* – pp 103-114.
- Be able to complete overall reactions and net ionic reactions.
- Know the basic solubility rules that apply to the ions in the experiment.
 - All nitrates of all metals are soluble.
 - All sodium, potassium, and ammonium salts are soluble.
 - All chlorides are soluble except silver, lead (II), and mercury (I).
 - All sulfates are soluble except barium, calcium, strontium, lead (II), and mercury (I).
 - Carbonates and chromates of sodium, potassium, and ammonium are soluble;
all others are insoluble.
 - Sulfides of barium, calcium, magnesium, sodium, potassium, and ammonium are soluble; all others are insoluble.
 - Hydroxides of sodium, potassium, and ammonium are soluble.
Hydroxides of barium and calcium are moderately soluble.
 - Everything else will be considered insoluble!
- Given a precipitation chart be able to determine what compounds were in a set of unknowns.
- Be able to give the flame color for sodium, potassium, iron, barium, and copper.

7. Dimensional Analysis & Using Exponential Notation and Significant Figures

- Read over Dimensional Analysis #1-3 – pp 13-26 and Sig Figs pp. 33-50.
- Be able to do Dimensional Analysis problems like those in sets #1-3 and Using Exponential Notation and Significant Figures problem sets 1 and 2.
- Know the **Rules for Significant Figures**.
 - All non-zero digits are significant,
for example, 123 has three significant figures.
 - Zeros between non-zero digits are significant,
for example, 12.507 has five significant figures.
 - Zeros to the left of the first non-zero digit are not significant,
for example, 1.02 has three significant figures,
0.12 has two significant figures, and
0.012 also has two significant figures.
 - If a number ends in zeros to the right of the decimal point, those zeros are significant,
for example, 2.0 has two significant figures and 2.00 has three significant figures.