Midterm Review Chem 002 – FS/06

1. **MSDS and Safety**
   a. Know where the safety equipment is located in your lab.
   b. Know the MSDS information for the first five experiments.

2. **Statistical Analysis**
   a. Read over Statistical Analysis of Experimental Data (PROP 353) – purple book pp. 9-13.
   b. Know Equations 1-5 and know the names of each equation.
      1. Average or mean: $x = \Sigma x_i / n$
      2. Standard Deviation: $\sigma = \sqrt{\Sigma (x_i - x)^2 / n}$
      3. Estimate of the Standard Deviation: $s = \sqrt{\Sigma (x_i - x)^2 / (n-1)}$
      4. Confidence Interval (CI) for a single value: $CI_{single} = \pm ts$
      5. Confidence Interval (CI) for the mean: $CImean = \pm ts / \sqrt{n}$
   c. Know the differences between equations 2-3 and 4-5 and when each of these equations is applicable.

3. **Determining the Thickness of a Coating**
   a. Read over Determining the Thickness of Zinc on Galvanized Washers (ANAL 909) – purple book pp. 47-56
   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.

4. **The Empirical Formula of a Compound**
   a. Read over Determining the Empirical Formula of Copper Chloride (STOI 386) – purple book pp. 57-68.
   b. Know how to determine the percent composition of a compound, if given initial and final masses.
   c. 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**
   a. Read over Separating the Components of a Ternary Mixture (PROP 375) – purple book pp. 35-46.
   b. Be able to make a flowchart if given a table of components in a mixture.
   c. Know how to determine the percent of each of the components in the mixture.
   d. Know how to determine the percent recovery and the percent error of the overall composition.

6. Antacids

a. Read over green book 6-1 to 6-5.

b. Know how to write balanced equations for each of the antacids and HCl:

_____ $NaHCO_3$ + _____ HCl → _____ + _____

_____ $CaCO_3$ + _____ HCl → _____ + _____

_____ $Al(OH)_3$ + _____ HCl → _____ + _____

_____ $MgCO_3$ + _____ HCl → _____ + _____

_____ $Mg(OH)_2$ + _____ HCl → _____ + _____

c. Given the mass of the antacid be able to calculate the number of moles of the antacid.

d. Having calculated the number of moles of antacid, be able to determine the theoretical number of moles of HCl used to neutralize the antacid.

e. Having calculated the number of moles of HCl used to neutralize the antacid, determine the number of grams (and/or mg) of HCl neutralized.

f. Given the concentrations of HCl and NaOH and the buret readings for each, be able to calculate the actual number of moles of HCl neutralized by the antacid.

g. Be able to compare and contrast the similarities and differences between the actual and theoretical amounts of HCl neutralized.