

# STOICHIOMETRY SYLLABUS

## *Stoichiometry: Calculations with Chemical Formulas and Equations*

### I. Major Topics:

- A. Chemical Equations
- B. Simple Patterns of Reactivity
- C. Formula Weights
- D. The Mole
- E. Empirical Formulas and Analysis
- F. Quantitative Information and Balanced Equations
- G. Limiting Reactants

### II. Objectives/Guidelines:

1. To practice writing and balancing equations
  - Don't forget about the "Magic Seven" diatomic elements (HONCIBrIF "Heck No Halogens")
  - Be able to write and balance reactions such as, combustion, synthesis, single/double displacement, decomposition
2. Be able to describe what is happening on a molecular level in a chemical reaction.
3. State and explain the significance of the Law of Conservation of Mass.
4. Distinguish between formula and molecular weights.
5. Be able to break down any compound or molecule into its % composition by mass.
6. What does the mole represent?
7. Be able to convert from {# of particles  $\Leftrightarrow$  Mole} & {gram  $\Leftrightarrow$  Mole} calculations for any element or compound.
8. What is the difference between an empirical formula and a molecular formula?
9. Be able to determine an empirical formula. Given the molar mass, be able to determine the molecular formula.
10. Practice STOICHIOMETRY! Be able to:
  - Write chemical formulas and equations from worded expressions.
  - Balance equations
  - Given any amount of reactant or product (mass, moles or # of particles) be able to determine the quantity of another reactant or product (mass, moles or # of particles) that will be used up or needed. UNDERSTAND AND BE ABLE TO SECURELY TRAVEL THE ROAD TO MOLEVILLE!
11. Be able to determine a limiting reagent. Be able to calculate the amount (in mass, moles or # of particles) of the excess reagent that will remain after the reaction is complete.
  - Remember, the first step is to determine which reactant will produce the LEAST amount of product. If it reacts completely, how much product will it make? This reactant is the LIMITING REACTANT (often referred to as a limiting reagent).
12. Be able to calculate the percent yield in a reaction. {How much stuff did you recover from the amount that was initially present?}

**Problem Set # 1.** Complete the following problems from your Brown, LeMay & Bursten chemistry text. Show all of your work! (No Work = No Credit). The answers to the odd numbered problems are in the back of your text. It is your responsibility to get yourself in an academic position to answer ALL of these problems. If needed – PLEASE ASK ME FOR HELP!

**PROBLEMS:** 3.2, 3.3 (make sure you explain your choice), 3.4, 3.5, 3.6, 3.8, 3.14, 3.16, 3.18, 3.24, 3.28, 3.30, 3.34, 3.40, 3.44, 3.52, 3.55, 3.56, 3.60, 3.64, 3.70, 3.75

**DUE DATE:** \_\_\_\_\_