CHAPTER 3: FORMULAS, EQUATIONS, AND MOLES

Section 3.1
- For simple chemical reactions, write and balance chemical equations.
- Do Problems 1 – 3; do problems 38 - 42.

Section 3.2
- Differentiate between microscopic and macroscopic interpretations of chemical formulas.

Section 3.3
- Interconvert grams, moles, and numbers of formula units.
- Determine the number of moles and grams of one reactant needed to react with a given number of moles and grams of another reactant and the number of moles and grams of product(s) that result from the reaction.
- Do Problems 4 – 6; do the even problems 44 - 70.

Section 3.4
- Calculate percent yield.
- Calculate the number of grams of products produced from a given number of grams of reactants when the theoretical yield is less than 100%.
- Do Problems 7, 8.

Section 3.5
- Identify the limiting and excess reagents in a reaction mixture.
- Determine the number of grams of excess reagent remaining at the end of a reaction and the number of grams of product(s) produced.
- Do Problems 9 – 11, 36, 72 – 82 even.

Section 3.6
- Describe how to prepare a solution of known molarity by dissolving a solid in a solvent.
- Calculate the number of moles of solute in a given volume of solution and vice versa.
- Do Problems 12 - 15.

Section 3.7
- Describe how to prepare a solution of known molarity by diluting a more concentrated solution.
- Determine the final concentration of solution after dilution.
- Do Problems 16, 17.

Section 3.8
- Interconvert solution molarity, solution volume, solute moles, and solute grams.
- Do Problems 18, 19.

Section 3.9
- Determine the volume of one reactant needed to react with a given volume of a second reactant.
- Determine the molarity of an acid or base solution by titration.
- Do Problems 20, 84 – 96 even.

Section 3.10
- Determine the percent composition and empirical formula of a compound.
- Do Problems 22 - 24.

Section 3.11
- Use combustion analysis data to obtain the empirical formula of a compound containing carbon, hydrogen, and one other element.
- From empirical formula and molar mass, determine the molecular formula of a compound.
- Do Problems 25 - 27 (On Problem 25, use 1.153 mg H₂O and 2.816 mg CO₂), 32, 98 – 112, even (on #112, 17.329 mg CO₂ instead of 1.444 mg.)

Section 3.12
- Read this section to learn how atomic and molecular masses can be determined by mass spectrometry.

Advice from a former student:
I had a very good chemistry teacher in high school, so that has helped me a lot here. However, I have found it challenging here and that I work more independently. I’ve found it helps to read the chapters and take notes so I can grasp the concepts easier. Staying caught up in assignments and actually doing the homework has allowed me to understand the lectures better than if I wasn’t prepared for that day.