CHM 100
Chapter 9 Study Guide / Learning Objectives

Chapter 9 in your textbook concerns chemical calculations. In chemical calculations, you use a chemical equation to relate the amount of one substance to the amount of another. This kind of calculation is useful because it lets us determine how much starting material we would need to produce a desired amount of product. Alternatively, we can predict how much product we will make in a chemical reaction from a given amount of starting material.

You are responsible for the calculations in sections 9.1 through 9.3. You must know the concept of limiting reactant from section 9.4, but I will not require you to perform the calculations in sections 9.5 and 9.6. (You should still learn definitions of *terms* from 9.5 and 9.6 as described below.)

At the end of this chapter, you should be able to ...

[Terminology]
   ● Define the following terms: **limiting reactant**, **theoretical yield**, **actual yield**, **percent yield**.

[Mole calculations]
   ● Calculate the **moles** of either a reactant or a product given the moles of any other reactant or product and a balanced chemical equation relating the two.
   ● **Solve problems** like Example 9.3, p253 and #12, p278.

[Mass calculations]
   ● Calculate the **mass** of either a reactant or a product given the mass of any other reactant or product and a balanced chemical equation relating the two. Note that this will require you to determine **formula weights** of the chemicals you're using.
   ● **Solve problems** like Example 9.4, p256 and #26, p279.

[Limiting reagents and yields]
   ● Explain when a chemical reaction between two or more substances will stop.
   ● Explain several factors that can cause you to get less product in a reaction than you might expect.
   ● Predict which of the reactants in a chemical reaction will run out first (for simple cases).

[Old skills to review]
   ● You need to be able to calculate formula weights (Chapter 8). You may also need to balance chemical equations (Chapter 6) to solve some problems from this chapter.

[Practice]
- Mole calculations: (p278-285) Q&P 12, 14, 16
- Mass calculations: (p278-285) Q&P 24, 26, 28, 30, 38, 42, 44, 84, 86