

**Background:** Chemical reactions can very easily be compared to cooking. This is so prevalent that any chemist who appears to be interested in cooking is rationalized by the lab. “Oh, you like to bake?” I’ve been asked, “It must be like being in the lab.” Nope. I just really like cookies.

But to reinforce a stereotype, there is an analogy worth exploring. When combining ingredients in a recipe or chemicals in a lab, there is some expectation of how much product (or cake) will be made. A certain amount of one chemical is needed to make a certain amount of another.

This brings us to stoichiometry, the mass balancing act of any chemical reaction. In this process we are able to determine the amount of any substance that goes in to or comes from a chemical reaction from any other amount. That is, if I know how much propane goes into a reaction, I can calculate how much carbon dioxide is produced.

As you can imagine this is incredibly handy, and it is the cornerstone of any general chemistry class. We will introduce the topic here, and spend some time with its calculations. This will include the special circumstance that comes up when one of your reactants runs out before another (think hot dogs and buns).

For those of you going on to general chemistry, this is a week to remember. You will be using it a lot in the future. For those of you who are not pursuing any more chemistry, we’ll get you through this. It’ll be fun!

**Objectives:**

1. Determine mass relationships between species in a balanced chemical reaction.
2. Identify the limiting reagent in a chemical reaction.
3. Discern between theoretical and actual yield of a chemical reaction.
4. Calculate the percent yield of a chemical reaction.

**Reading:** Zumdahl Chapter 9