Chapter 6 Quantities in Chemical Reactions
Learning Objectives

6.1 The Meaning of a Balanced Equation

- Describe the use and meaning of coefficients in a balanced chemical equation.
- Use molecular diagrams to represent a chemical reaction.
- Relate the numbers of molecules of reactants and products involved in a reaction to the coefficients in a balanced equation.

6.2 Mole-Mole Conversions

- Use a balanced equation to relate the number of moles of reactants and products in a chemical reaction.
- Use mole ratios to carry out mole-mole conversions for a chemical reaction.

6.3 Mass-Mass Conversions

- Use a balanced equation to relate the masses of reactants and products in a chemical reaction.
- Use mole ratios and molar masses to carry out mass-mass conversions for a chemical reaction.

6.4 Limiting Reactants

- Determine which reactant limits the amount of product that can form in a chemical reaction.
- Identify the limiting reactant from observation of a chemical reaction at a macroscopic level.
- Identify the limiting reactant by examining molecular diagrams for a reaction mixture.
- Identify the limiting reactant by examining the number of moles of reactants in a reaction mixture.
- Identify the limiting reactant in a reaction and calculate the amount of product present when the reaction is complete.
- Calculate the amount of reactant remaining that was in excess.

6.5 Percent Yield

- Compare the amount of product actually obtained to the amount expected in a chemical reaction.
- Calculate the percent yield from the actual yield and the theoretical yield.

6.6 Energy Changes

- Discuss the implications of the Law of Conservation of Energy.
- Distinguish between exothermic and endothermic reactions.
- Convert between different units of energy.
- Describe the factors that affect the amount of heat change for a process.
- Use specific heat to compare temperature changes for heating or cooling substances.
- Use quantitative relationships related to energy including specific heat and calorimetry.

6.7 Heat Changes in Chemical Reactions

- Describe how heat changes are involved in chemical reactions.
- Determine the amount of heat change in a chemical reaction.
- Use balanced equations to calculate the heat change for a chemical reaction.
- Compare the energy content of various fuels, and of various food components.