



## SECTION 1 Introduction to Stoichiometry

### KEY TERMS

- Reaction stoichiometry involves the mass relationships between reactants and products in a chemical reaction.
- Relating one substance to another requires expressing the amount of each substance in moles.
- A mole ratio is the conversion factor that relates the amount in moles of any two substances in a chemical reaction. The mole ratio is derived from the balanced equation.
- Amount of a substance is expressed in moles, and mass of a substance is expressed by using mass units such as grams, kilograms, or milligrams.
- Mass and amount of substance are quantities, whereas moles and grams are units.
- A balanced chemical equation is necessary to solve any stoichiometric problem.

composition stoichiometry  
reaction stoichiometry  
mole ratio

## SECTION 2 Ideal Stoichiometric Calculations

- In an ideal stoichiometric calculation, the mass or the amount of any reactant or product can be calculated if the balanced chemical equation and the mass or amount of any other reactant or product is known.

## SECTION 3 Limiting Reactants and Percentage Yield

### KEY TERMS

- In actual reactions, the reactants may be present in proportions that differ from the stoichiometric proportions required for a complete reaction in which all of each reactant is converted to product.
- The limiting reactant controls the maximum possible amount of product formed.
- For many reactions, the quantity of a product is less than the theoretical maximum for that product. Percentage yield shows the relationship between the theoretical yield and actual yield for the product of a reaction.

limiting reactant  
excess reactant  
theoretical yield  
actual yield  
percentage yield