Reinforcement

Chapter 8

BLM 8-1

Solution Chemistry Basics

Goal

To review and assess knowledge of previously learned concepts in solution and acid-base chemistry.

Procedure

Answer the following questions in the space provided. If needed, use a separate piece of paper for your calculations and answers.

1. **(a)** Define an acid and a base according to the Arrhenius theory.

   (b) Define an acid and a base according to the Brønsted-Lowry theory.

2. How does diluting an acidic or basic solution affect the pH of the solution?

3. Write the complete, ionic, and net ionic equations for the reaction between aqueous sodium hydroxide and aqueous nitric acid.

4. If 80 mL of 4 mol/L H_2SO_4 is diluted to 400 mL by adding water, what is the new molar concentration?

5. In a titration experiment using a strong acid and a strong base, $HCl_{(aq)}$ and $NaOH_{(aq)}$, 27.68 mL of $HCl_{(aq)}$ is used to neutralize 50.00 mL of 0.100 mol/L $NaOH_{(aq)}$. Using the steps outlined below, determine the concentration of the $HCl_{(aq)}$.

(a) Write the balanced chemical equation for this reaction.

(b) How many moles of $NaOH_{(aq)}$ are initially present?

(c) How many moles of $HCl_{(aq)}$ are required to completely react with the moles of $NaOH_{(aq)}$ calculated in (b)?

(d) Determine the concentration of $HCl_{(aq)}$.