Skill Practice 53

Molarity Practice

Name: _____

Date: _____

Hour: _____

1. Calculate the molarity of the following solutions:

   a) 45 g of Na_2SO_4 in 150 mL of solution.

   b) 24.6 g of $(NH_4)_2CO_3$ in 75 mL of solution.

   c) 73.1 g of $Ca(NO_3)_2$ in 125 mL of solution.

2. What is the concentration of sulfate ions, SO_4^{-2}, in each of the following?

   a) 0.75 M $Al_2(SO_4)_3$ b) 1.35 M Na_2SO_4

3. What is the molarity of chlorine ions in solution when 47 g of $AlCl_3$ is dissolved in a 210 mL of solution?

4. Which of the following solutions has the highest concentration? Prove using calculations.

   A) 12.5 g of $CaCl_2$ in 40 mL of solution B) 20.9 g of MgI_2 in 35 mL

5. How many grams of salt (NaCl) need to be dissolved in 300 mL of solution to give you a solution that has a concentration of 1.2 M? (Hint: you need to work backwards on this one. You are given the molarity and the liters, so find the moles and convert to grams.)

Skill Practice 54

Concentration Practice

Name: _____

Date: _____

Hour: _____

1. What is the mass percent of calcium chloride if 45 g of $CaCl_2$ is dissolved in 320 g of water?

2. A solution is prepared by dissolving 32 g of salt in 278 g of water.
   A) What is the mole fraction of salt in the solution?

   B) What is the mole fraction of water in the solution?

3. How many grams of calcium nitrate needs to be added to 400 g of water to make a solution that is 12.5% by mass of $Ca(NO_3)_2$?

4. A certain solution of salt water has a molality of 3.25 m.
   a) What is the mole fraction of salt in the solution?

   b) What is the mass percent of salt in the solution?

5. If 325 mL of a solution was prepared by dissolving 83.8g of Na_3PO_4 in 310 g of water…
   a) What is the molarity of the solution?

   b) What is the molality of the solution?

6. Describe how you could prepare 200 mL of a solution that is 1.2 M NaCl.

Skill Practice 65

Solubility Practice

Name: _____

Date: _____

Hour: _____

1. What is the solubility (in g/L) of calcium phosphate? (Hint: Find K_{sp} in book.)

2. Lead(II) hydroxide has a solubility of 0.00975 g/L. What is K_{sp} for this salt?

3. The solubility of the mostly insoluble compound silver sulfate is 0.0044 g/L. Calculate the K_{sp} for silver sulfate (Ag_2SO_4).

4. Calculate the solubility in g/L of $Pb_3(AsO_4)_2$. $K_{sp} = 4.0 \times 10^{-36}$.

Skill Practice 67

Affecting Solubility Practice

Name: _____

Date: _____

Hour: _____

1. Calculate and compare the molar solubility of CdC_2O_4 ($K_{sp} = 1.5x10^{-8}$) in pure water and in 0.15 M cadmium chloride (a soluble salt).

2. Determine if a precipitate of $CaSO_4$ will form from a solution that is 0.0025 M in calcium chloride and 0.029 M in sodium sulfate.

3. Which of the following salts would be most soluble in acidic pH—magnesium oxalate or magnesium bisulfate ($MgHSO_4$)?

4. The solubility of the partially soluble salt silver carbonate (Ag_2CO_3) in water is 2.6 g/L. What is the solubility (in g/L) of Ag_2CO_3 in a 0.035 M solution of silver nitrate? (Hint: first calculate K_{sp} using the 2.6 g/L.)