Name: _____ Section: _____

Data and Calculations for Experiment 5

A. Concentration of a Saturated Solution (record all masses as x.xxx g)

1. a) Mass of evaporating dish _____

   b) Mass of evap. dish and potassium chloride solution _____

   c) Mass of evap. dish and residue _____

2. Calculate: (show setups)
   a) Mass of potassium chloride solution _____

   b) Mass of residue _____

   c) Mass of water in potassium chloride solution

   _____

   d) Mass percent of potassium chloride in the solution

   _____

   e) Grams of potassium chloride per 100 g of water in the solution

   _____

B. Relative Solubility of a Solute in Two Solvents

1. a) Which liquid is denser, decane or water? _____

   b) How did you decide which layer was water?

2. What is the color of iodine in water? _____

   What is the color of iodine in decane? _____

3. Which solvent dissolves more iodine? How did you decide this?

Name: _____ Section: _____

C. Miscibility of Liquids

1. Which liquids were miscible with each other?

2. Which liquids were immiscible with each other?

D. Particle Size and Dissolution Rates

1. How long did it take the fine salt crystals to dissolve?

2. How long did it take the coarse salt crystals to dissolve?

3. Based on these observations, how does particle size affect the rate at which a substance is able to dissolve?

E. Temperature and Dissolution Rates

1. How long did it take the salt crystals to dissolve in hot water?

2. How long did it take the salt crystals to dissolve in cold water?

3. Based on these observations, how does temperature affect the rate at which a substance is able to dissolve?

F. Temperature and Solubility

1. Was the solution with 1.0 g of NaCl in 5.0 mL water saturated at room temperature?

2. Was the solution with 1.0 g of NH_4Cl in 5.0 mL water saturated at room temperature?

3. Was the solution with 2.4 g of NaCl in 5.0 mL water saturated at room temperature?

4. Was the solution with 2.4 g of NH_4Cl in 5.0 mL water saturated at room temperature?

5. Which salt was least soluble at higher temperatures?

6. At the higher temperatures, was the NaCl solution saturated?

7. At the higher temperatures, was the NH_4Cl solution saturated?

8. What happened to the NaCl solution when it was cooled back to room temperature?

9. What happened to the NH_4Cl solution when it was cooled back to room temperature?

10. Solubility is defined as the amount of solute that can dissolve in a given quantity of solvent. Based on your observations in this part, how does temperature affect the solubility of solid solutes? Does it affect different substances in identical ways?

G. Ionic Reactions in Solution

1. Write the formulas for the following substances. Include states of matter (e.g. $_{(aq)}$ or $_{(s)}$) based on the results of your experiment:

   barium sulfate _____

   barium chloride _____

   sodium sulfate _____

   sodium chloride _____

2. Write the equation that shows the reaction of barium chloride and sodium sulfate. Use state indicators (e.g. $_{(aq)}$ or $_{(s)}$) for all compounds.

3. Which compound is the white precipitate? How do you know this?