**Worksheet #1 Solubility** Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period \_\_\_\_\_\_

***Use the solubility curves on the attached page to answer the following questions.***

1a. These solubility curves are based on the solubility (in grams) of various salts dissolving in

\_\_\_\_\_\_\_\_ grams of water.

b. The solubility of most **solids** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as the **temperature** of the solvent **increases**.

c. The solubility of all **gases** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as the **temperature** of the solvent **increases**.

2. Most and least soluble at different temperatures:

a. Which salt is **least** soluble at 20⁰C? \_\_\_\_\_\_\_\_\_\_\_\_

b. Which salt is **most** soluble at 10⁰C? \_\_\_\_\_\_\_\_\_\_\_\_

c. For which salt does the solubility change the least? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. How many grams of each solute below are needed to make a **saturated** solution at 80⁰C?

a. NH4Cl \_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. KCl \_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. NaCl \_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. How many grams of solute are needed to make a saturated solution at 80⁰C in the quantities of water

indicated? (Hint: look at question #3 to help you.)

a. \_\_\_\_\_\_\_\_\_\_ grams NH4Cl in 200 gram H2O

b. \_\_\_\_\_\_\_\_\_\_ grams KCl in 300 grams of H2O

c. \_\_\_\_\_\_\_\_\_\_ grams NaCl in 50 grams of H2O

5. How many grams of each solute below are needed to make a **saturated** solution at 50⁰C?

a. KClO3 \_\_\_\_\_\_\_\_\_\_\_\_

b. NaNO3 \_\_\_\_\_\_\_\_\_\_\_\_

c. KNO3 \_\_\_\_\_\_\_\_\_\_\_\_

6. At what temperature are the following solutes equally soluble in 100g of water?

a. NaNO3 and KNO3 \_\_\_\_\_\_\_\_\_\_\_

b. KNO3 and NaCl \_\_\_\_\_\_\_\_\_\_\_

c. NaCl and KCl \_\_\_\_\_\_\_\_\_\_\_

7. Describe each of the following solutions below as **saturated or unsaturated.**

a. 85 g KNO3 placed in 100 g water at 60⁰C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. 40 g KCl placed in 100 g water at 40⁰C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. 20 g KClO3 placed in 100 g water at 30⁰C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. If each of the following solutions is saturated at the first temperature listed, how much more solute needs

to be added to keep it soluble at the higher temperature?

a. NaCl 10⁰C to 80⁰C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. NH4Cl 20⁰C to 90⁰C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. KNO3  50⁰C to 60⁰C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. If each of the following solutions is saturated at the first temperature listed, how much solute will precipitate

out as the temperature drops to the lower temperature?

a. NH4Cl 90⁰C to 50⁰C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. KClO3 50⁰C to 28⁰C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. KI 25⁰ C to 2⁰C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Solubilities as a Function of Temperature**

