Name: _____ **Date:** _____

Chemistry *~ Ms. Hart* **Class:** Anions or Cations

THE URBAN ASSEMBLY SCHOOL FOR CRIMINAL JUSTICE

8.5 Saturation (Using Table G) - Classwork/ Homework

1. A student uses 50 grams of water at a temperature of 40°C to prepare a saturated solution of potassium nitrate, KNO_3. How many grams of KNO_3 must be used to create this saturated solution?

Given: _____

Need to find: _____

Ratio:

2. How much potassium nitrate, KI is needed to saturate 25 grams of water at 10°C?

3. How many grams of sodium chloride, NaCl must be used to prepare a saturated solution of NaCl using 300 grams of water at a temperature of 90°C?

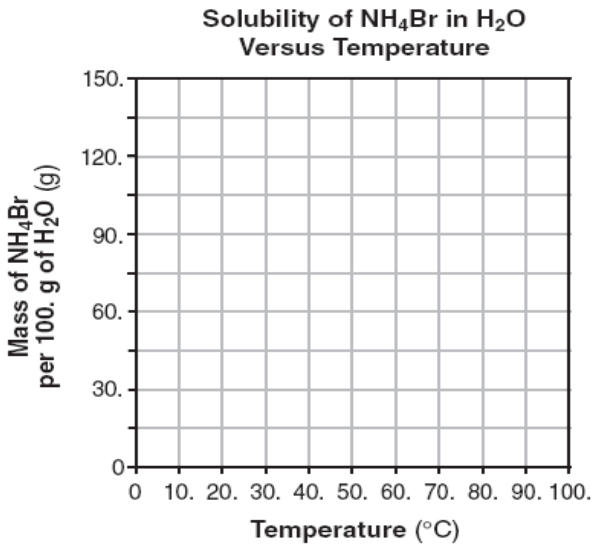
Base your answers to questions 3 through 5 on the information below.

The compounds $NH_4Br(s)$ and $NH_3(g)$ are soluble in water. Solubility data for $NH_4Br(s)$ in water are listed in the table below.

1. On the grid below, plot the data from the data table. Circle and connect the points.

Solubility of NH_4Br in H_2O

Temperature (°C)	Mass of NH_4Br per 100. g of H_2O (g)
0	60.
20.	75
40.	90.
60.	105
80.	120.
100.	135



2. Determine the total mass of NH4Br(s) that must be dissolved in 200. grams of H2O at 60.°C to produce a saturated solution.

3. Compare the solubilities of NH4Br(s) and NH3(g), each in 100. grams of H2O, as temperature increases at standard pressure. Your response must include *both* NH4Br(s) and NH3(g).

Base your answers to questions 6 and 7 on the information below.

A solution is made by completely dissolving 90. grams of $KNO_3(s)$ in 100 grams of water in a beaker. The temperature of a solution is 65°C.

4. Describe the effect on the solubility of $KNO_3(s)$ in this solution when the pressure on the solution increases.
5. Determine the total mass of $KNO_3(s)$ that settles to the bottom of the beaker when the original solution is cooled to 15°C.

6. Are the following solutions saturated, unsaturated or supersaturated (assume that all three could form supersaturated solutions)
   a. 40. g of KCl in 100 mL of water at 80°C

   b. 120. g of KNO_3 in 100 mL of water at 60°C

   c. 80. g of $NaNO_3$ in 100 mL of water at 10°C

7. Which of the salts shown on the graph is the least soluble in water at 10°C?

8. Which of the salts shown on the graph has the greatest increase in solubility as the temperature increases from 30 degrees to 60 degrees?

9. At what temperature do saturated solutions of potassium nitrate and sodium nitrate contain the same mass of solute per 100 g of water?

10. What two salts have the same degree of solubility at approximately 19°C?

11. How many grams of potassium chlorate must be added to 1000 g of water to produce a saturated solution at 50°C?

12. Identify the three gases whose solubility curves are shown on Table G.

13. At 10°C, how many grams of sodium nitrate, $NaNO_3$ will dissolve in 100 mL H_2O to make a saturated solution?

14. At 40°C, 60 g sulfur dioxide, SO_2 are dissolved into 100 mL H_2O. Is this solution unsaturated, saturated, or supersaturated?

Base your answers to questions 17 and 18 on the information below.

A beaker contains 100.0 milliliters of a dilute aqueous solution of ethanoic acid at equilibrium. The equation below represents this system.

$$HC_2H_3O_2(aq) \rightleftharpoons H^+(aq) + C_2H_3O_2^-(aq)$$

15. Compare the rate of the forward reaction to the rate of the reverse reaction for this system.

16. Describe what happens to the concentration of $H^+(aq)$ when 10 drops of concentrated $HC_2H_2O_2(aq)$ are added to this system.