Solutions Exam Review Sheet

Name _____ Date _____ Mod _____

A. Use the solubility chart to answer the following questions.

Solubility in g/100 g water

Substance	0°C	20°C	50°C	100°C
$CuSO_4$	14.3	20.7	33.3	75.4
KCl	27.6	34.0	42.6	57.6
$NaNO_3$	74.0	88.0	114.0	182.0
Li_2CO_3	1.5	1.3	1.1	0.70

1. What is the most sodium nitrate 100g of water can hold at 50°C?
2. At what temperature is 100g water saturated with 33.3g copper (II) sulfate?
3. A solution of lithium carbonate is saturated at 100°C. How much solute will settle out if the solution is cooled to 0°C?
4. A solution of potassium chloride is saturated at 50°C. How much potassium chloride must be added to keep the solution saturated at 100°C?

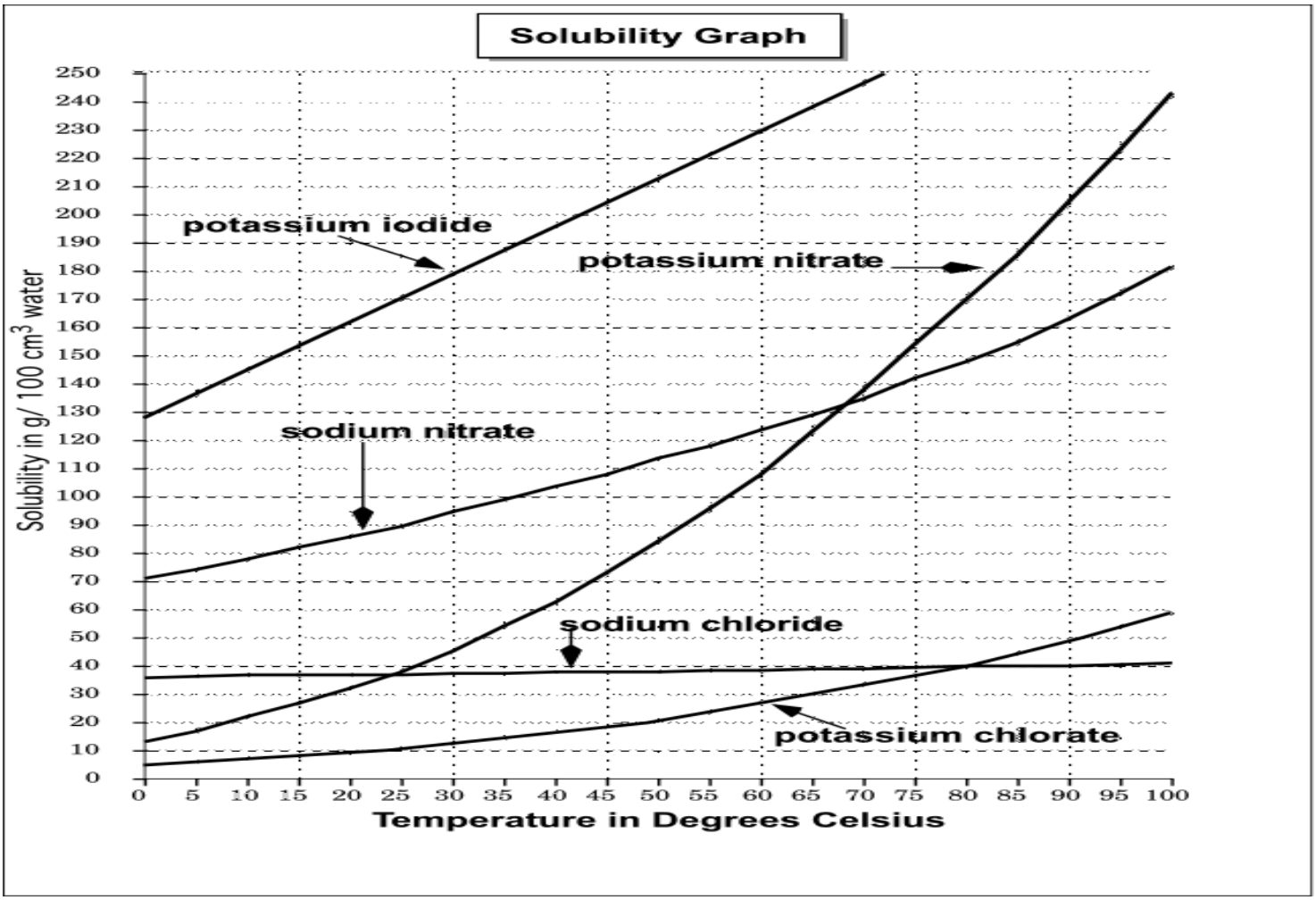
B. Solution problems:

1. A 25.0% potassium chloride solution fills a 50.0 ml beaker. How many grams of potassium chloride does the beaker contain?
2. An acid solution is labeled 5.0% hydrochloric acid, how much acid is in a 200.ml container?
3. A 600.ml bottle of rubbing alcohol contains 420.ml of isopropanol and 180.ml of water. What percent of the bottle is isopropanol?
4. How many grams of sodium chloride are found in a 350ml bottle containing a 15.0% solution of sodium chloride in water?
5. A 400.0ml bottle of hydrogen peroxide (H_2O_2) contains 3.00% peroxide. How much water is in the bottle? How much peroxide?

C. Terms and ideas to know and understand:

- Solubility
- Solution
- Concentrated
- Dilute
- Solute
- Solvent
- Factors that increase dissolving rate for solids and gases in solution.
- Saturated
- Unsaturated
- Undissolved
- Supersaturated
- Enthalpy
- Concentration Problems – part of total
- Molarity
- "Like dissolves like"
- Ionization
- Dissociation
- Just dissolving
- Electrolyte
- Nonelectrolyte
- Polar vs. nonpolar covalent vs. ionic compound
- How do solutes affect melting and boiling points

D. Use the following solubility graph to answer the following questions.



1. How many grams of potassium nitrate will saturate 100g of water at 72°C?
2. Which substances have the same solubility ate 80°C?
3. Which substance has the highest solubility at 30°C?
4. 30 g of which substance can saturate 100g of water at 20°C.
5. At which temperature can 205g of KI saturate 100g of water?
6. Which substance is least soluble at 90°C?

E. Molarity problems. Show all of your work!

a. Find the <u>mass</u> of the solute in the following:
   1. 2.00 dm^3 of 0.25M NaOH solution
   2. 0.34 L of 1.50M HCl solution
   3. 1.45 dm^3 of 0.75M $Ca(OH)_2$ solution

b. Find the <u>molarity</u> of the following:
   1. a 1.00 dm^3 solution that contains 16.5 g of $CaCO_3$
   2. a 2.00 L solution that contains 59.0 g of $AgNO_3$
   3. a 0.50 L solution that contains 11.5 g of $MgSO_4$