Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date: \_\_\_\_\_\_\_\_\_\_\_\_

1. For the following identify the solute and solvent

|  |  |  |
| --- | --- | --- |
| SITUATION | SOLUTE | SOLVENT |
| 1. 5 moles of acetic acid are mixed with 30 moles of

 water to make vinegar |  |  |
| B) A lake is polluted with nitrogen and phosphorus |  |  |
| c) 0.75 grams of perfume is sprayed and diffuses throughout the air we breathe. |  |  |
| D) Sugar is dissolved in tea to make it sweet! |  |  |
| E) Oxygen and carbon dioxide molecules travel throughout  blood. |  |  |

1. Name three factors that influence the rate at which a solute dissolves in a solvent
2. Use the following words in a sentence:
3. Solubility
4. Saturated
5. Unsaturated
6. Miscible
7. Immiscible 
8. Supersaturated

**Part One: Reading Solubility Curves**

Use the graph to answer the following questions. REMEMBER UNITS!

1. What mass of solute will dissolve in **100 g** of water at the following temperatures?
	1. KNO3 at 70°C \_\_\_\_\_\_\_\_\_\_\_\_
	2. NaCl at 100°C \_\_\_\_\_\_\_\_\_\_\_\_
	3. NH4Cl at 90°C \_\_\_\_\_\_\_\_\_\_\_\_
	4. Which of the **above** three substances is most soluble in water at 15°C. \_\_\_\_\_\_\_\_\_\_\_\_

**Part Two: Types of Solutions** (saturated, unsaturated, supersaturated)

On a solubility curve, the lines indicate the concentration of a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solution** - the maximum amount of solute that will dissolve at that specific temperature.

Values on the graph \_\_\_\_\_\_\_\_\_\_\_\_ (below, above, on) a curve represent **unsaturated solutions** - more solute could be dissolved at that temperature.

Use the solubility curve on the first page to label the following solutions as saturated or unsaturated. If unsaturated, write how much more solute can be dissolved in the solution.

|  |  |  |
| --- | --- | --- |
| **Solution** | **Saturated or Unsaturated?** | **If unsaturated: How much more solute can dissolve in the solution?**  |
|  a solution that contains 70g of NaNO3 at 30°C (in 100 g H2O) |  |  |
| a solution that contains 50g of NH4Cl at 50°C (in 100 g H2O) |  |  |
| a solution that contains 20g of KClO3 at 50°C (in 100 g H2O) |  |  |
| a solution that contains 70g of KI at 0°C (in 100 g H2O) |  |  |

**Additional Practice:**

1. a. At 90°C, you dissolved 10 g of KCl in 100. g of water. Is this solution saturated or unsaturated?

 b. How do you know?

2. A mass of 100 g of NaNO3 is dissolved in 100 g of water at 80ºC.

 a) Is the solution saturated or unsaturated?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b) As the solution is cooled, at what temperature should solid first appear in the solution? Explain.

3. Use the graph to answer the following two questions:

 Which compound is most soluble at 20 ºC? \_\_\_\_\_\_\_\_

 Which is the least soluble at 40 ºC? \_\_\_\_\_\_\_\_

4. Which substance on the graph is **least** soluble at 10°C? \_\_\_\_\_\_\_

5. A mass of 80 g of KNO3 is dissolved in 100 g of water at 50 ºC. The solution is heated to 70ºC. How many more grams of potassium nitrate must be added to make the solution saturated? Explain your reasoning