Unit 9 Homework

Units of Concentration

1. **What is the concentration of a solution produced by dissolving 20g NaOH in enough water to produce a 250mL solution?**
   a. 0.5 M
   b. 0.25 M
   c. 1.0 M
   d. 2.0 M

2. **A solution is 10% hydrochloric acid (HCl) by mass, if a student has 250mL of solution what other information would be necessary to calculate the molarity (*M*) of the solution?**
   a. The temperature of the solution
   b. The density of the solution
   c. The identity of the solvent
   d. The solubility of HCl

3. **A solution is prepared by dissolving 20g benzene in 100g carbon tetrachloride, what is the percent by mass of the solution?**
   a. 17%
   b. 20%
   c. 83%
   d. 500%

4. **What is the molality (*m*) of a solution prepared by dissolving 29.25g NaCl in 3.00kg of water?**
   a. 0.0002
   b. 0.17
   c. 1.53
   d. 9.75

5. **What is the mole fraction of NaCl in a solution of 58.5g NaCl in 180mL H_2O?**
   a. 0.10
   b. 0.90
   c. 0.091
   d. 0.20

Dilutions

1. **What volume of 5.0M NaOH is needed to produce a 500mL solution of 1M NaOH?**
   a. 100mL
   b. 10mL
   c. 1mL
   d. 0.1mL

2. **How much water would you need to add to 10mL of 6.0M HCl, to produce a solution that is 0.2M?**
   a. 300
   b. 290
   c. 30
   d. 3.0

Use the following choices for the next two (2) questions. *You may select ALL that apply*

   a. Graduated cylinder
   b. Gram scale
   c. Pipet
   d. Volumetric flask

3. **What pieces of laboratory equipment would be most accurate to use to create a 1.0M KOH solution from solid KOH**

4. **What pieces of laboratory equipment would be most accurate to use to create a 0.1M solution from a 1.5M stock solution**

5. **What volume of 18.1M H$_2$SO$_4$ would be needed to produce 500mL of 1.0M H$_2$SO$_4$?**
   a. 9.0 L
   b. 0.5 L
   c. 0.1 L
   d. 27.6 mL

Solubility Curves

Use the solubility curve to the right to answer ALL questions in this section

1. **Which of the following solutions is a gas?**
   a. KI
   b. HCl
   c. NH$_4$Cl
   d. NaCl

2. **A solution that is made in which so much is added that a precipitate collects on the bottom is called:**
   a. Saturated
   b. Unsaturated
   c. Supersaturated
   d. Concentrated

3. **How many grams of NH$_3$ can dissolve in 50mL of water at 28°C?**
   a. 12.5g
   b. 25g
   c. 50g
   d. 100g

4. **Which of the following substances has the lowest solubility at 10oC?**
   a. SO$_2$
   b. KClO$_3$
   c. KI
   d. KNO$_3$

5. **How many grams of KNO$_3$ can dissolve in 150mL of water at 50oC?**
   a. 43g
   b. 85g
   c. 128g
   d. 170g
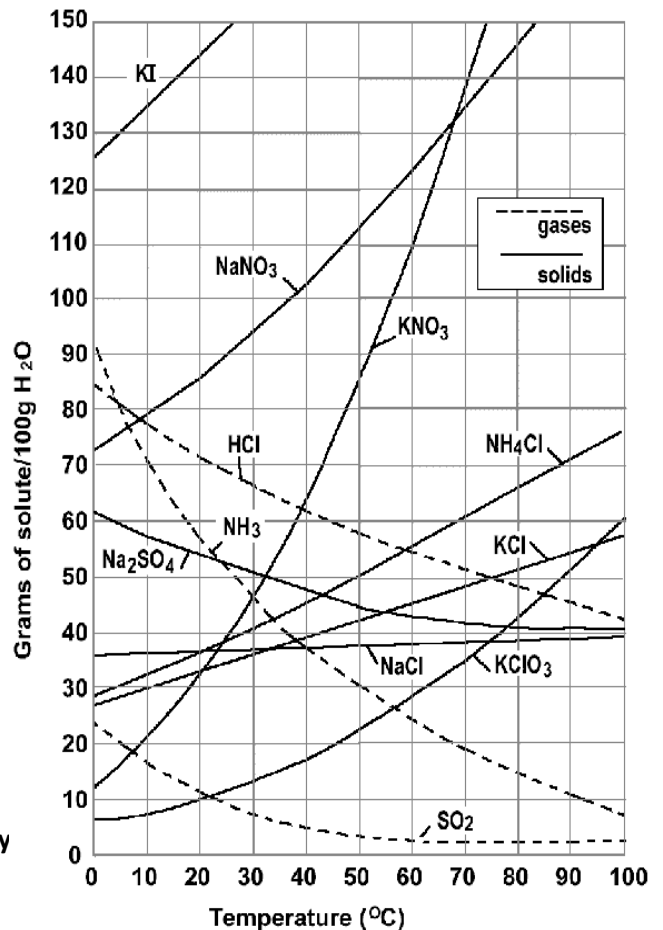
Colligative Properties

1. Which of the following solutions would have the highest boiling point?
   a. 0.2m NaCl
   b. 0.2m C_2H_5OH
   c. 0.2m K_2SO_4
   d. 0.2m Al_2S_3

2. An unknown nonelectrolyte is dissolved in 1kg of solvent, and the boiling point is increased by $10^\circ C$. Given that the boiling point elevation constant (K_b) is $1.00^\circ C/m$, determine the number of moles of solute present in solution.
   a. 1 mol
   b. 5 mol
   c. 8 mol
   d. 10 mol

3. A nonelectrolyte is added to 200g of water. Which of the following is true of the solution?
   a. The vapor pressure will decrease
   b. The boiling point will decrease
   c. The freezing point will increase
   d. The density will decrease

4. A 2.0m solution has a boiling point of $103.1^\circ C$. The Kb for water is $0.52^\circ C/m$, which of the following could be the solute?
   a. NaCl
   b. KOH
   c. CaF_2
   d. Al_2O_3

5. What is the boiling point of a solution that is produced by dissolving 20g NaOH in 2L H_2O if the K_b of H_2O is $0.52^\circ C/m$?
   a. $100.0^\circ C$
   b. $100.3^\circ C$
   c. $100.4^\circ C$
   d. $101.0^\circ C$

Unit 9 Homework

Name: _____

Units of Concentration

1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓐ Ⓑ Ⓒ Ⓓ
3. Ⓐ Ⓑ Ⓒ Ⓓ
4. Ⓐ Ⓑ Ⓒ Ⓓ
5. Ⓐ Ⓑ Ⓒ Ⓓ

Dilutions

1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓐ Ⓑ Ⓒ Ⓓ
3. Ⓐ Ⓑ Ⓒ Ⓓ
4. Ⓐ Ⓑ Ⓒ Ⓓ
5. Ⓐ Ⓑ Ⓒ Ⓓ

Solubility Curves

1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓐ Ⓑ Ⓒ Ⓓ
3. Ⓐ Ⓑ Ⓒ Ⓓ
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Colligative Properties

1. Ⓐ Ⓑ Ⓒ Ⓓ
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