

☆☆☆☆ $M = \frac{n}{L}$ } molal. = $\frac{n}{kg}$ } $\Delta t_b = k_b \cdot \text{molal.}$ } $\Delta t_f = k_f \cdot \text{molal.}$ Name: CALVIN
 Date: _____
 Hour: _____

Chemistry - Ch.15/16 Quiz

ANSWER UNITS??

1) Find the Molarity for a solution where 8.14 mol of Magnesium Hydroxide are dissolved in 7.00 L of water. $M = ?$

$n = 8.14 \text{ mol}$
 $V = 7.00 \text{ L}$
 $M = \frac{n}{V} = \frac{(8.14 \text{ mol})}{(7.00 \text{ L})} = 1.16 \text{ M Mg(OH)}_2$

2) Find the volume of 1.50 M NaCl needed for a reaction that requires 2.50 moles of NaCl.

$V = ?$
 $M = 1.50 \text{ M}$
 $n = 2.50 \text{ mol}$
 $V = \frac{n}{M} = \frac{(2.50 \text{ mol})}{(1.50 \frac{\text{mol}}{\text{L}})} = 1.67 \text{ L}$

3) Find the molality of a solution made from dissolving 0.425 moles of sucrose ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) in 0.225 kg of water.

molal. = ?
 $n = 0.425 \text{ mol}$
 $kg = 0.225 \text{ kg}$
 $\text{molal.} = \frac{n}{kg} = \frac{(0.425 \text{ mol})}{(0.225 \text{ kg})} = 1.89 \text{ molal. C}_{12}\text{H}_{22}\text{O}_{11}$

4) The boiling point of an aqueous solution containing a nonvolatile electrolyte is 100.94 degrees Celsius.

- a. What is the boiling point elevation? 0.94°C
- b. What is the molality of the solution?

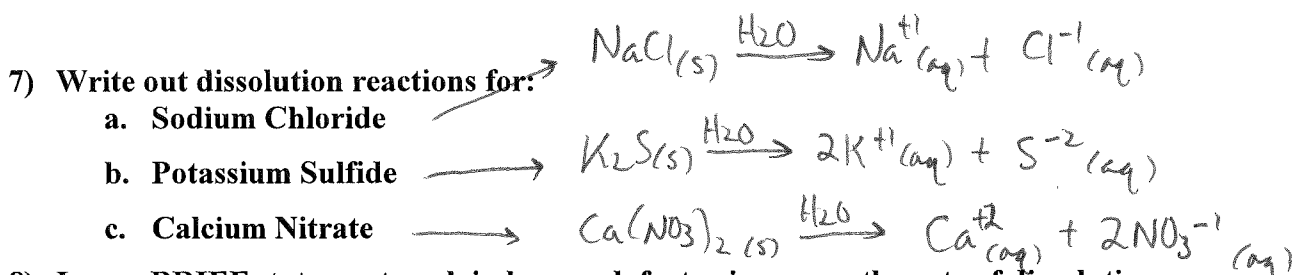
molal. = ?
 $\Delta t_b = 0.94^\circ\text{C}$
 $k_b = 0.512^\circ\text{C/molal.}$
 $\text{molal.} = \frac{\Delta t_b}{k_b} = \frac{(0.94^\circ\text{C})}{(0.512^\circ\text{C/molal.})} = 1.84 \text{ molal.}$

2nd 5) Find the freezing point depression when 0.479 moles of $\text{C}_6\text{H}_{12}\text{O}_6$ are added to 0.361 kg of water. 1st

$\Delta t_f = ?$
 $k_f = -1.86^\circ\text{C/molal.}$
 $n = 0.479 \text{ mol}$
 $kg = 0.361 \text{ kg}$
 $\text{molal.} = \frac{n}{kg} = \frac{(0.479 \text{ mol})}{(0.361 \text{ kg})} = 1.33 \text{ molal.}$
 $\Delta t_f = k_f \cdot \text{molal.} = (-1.86^\circ\text{C/molal.})(1.33 \text{ molal.}) = -2.47^\circ\text{C}$

6) If 85.0 mL of 4.00 M HCl is diluted to a new volume of 275 mL, find the new Molarity of the solution. (HINT: $C_1V_1 = C_2V_2$)

$V_1 = 85.0 \text{ mL}$
 $C_1 = 4.00 \text{ M}$
 $V_2 = 275 \text{ mL}$
 $C_2 = ?$
 $C_2 = \frac{C_1 \cdot V_1}{V_2} = \frac{(4.00 \text{ M})(85.0 \text{ mL})}{(275 \text{ mL})} = 1.24 \text{ M HCl}$



- 8) In one BRIEF statement explain how each factor increases the rate of dissolution:
- a. Agitation ~ brings fresh solvent in contact with solute
- b. Temperature ~ solvent particles collide with solute more often and more forcefully
- c. Surface area ~ more contact between solvent and solute

- 9) Name the following hydrates:
- a. $\text{K}_2(\text{SO}_4) \cdot 3\text{H}_2\text{O}$ Potassium Sulfate trihydrate
- b. $\text{AlCl}_3 \cdot 5\text{H}_2\text{O}$ Aluminium Chloride penta hydrate
- c. $\text{Fe}_2\text{O}_3 \cdot 4\text{H}_2\text{O}$ Iron (III) Oxide tetra hydrate

10) Complete the chart (Y or N for each):

	<u>Suspension</u>	<u>Colloid</u>	<u>Solution</u>
a. Settles	Y	N	N
b. Tyndall effect	Y	Y	N
c. Filters	Y	N	N

11) Term for two liquids that will not mix together (like oil and water) immiscible

12) Use the chart on the formulas page:

- a. Which one is NOT affected by temperature NaCl
- b. Which one is MOST affected by temperature KNO₃
- c. Which one becomes LESS soluble with temperature $\text{Yb}_2(\text{SO}_4)_3$
- d. How many grams of KNO₃ can be dissolved in 100g of water at 70 degrees Celsius? 120g

13) A solution that cannot hold any more solute is saturated

14) Two ways to dissolve more solute in a saturated solution are:

- i. Add more solvent
- ii. Increase temperature

15) Give ONE example where the solvent is NOT water:

Beer

Bonus ~ TBA: Draw a giraffe

GO VIKINGS!!!