

Name:
 Date: CALVIN
 Hour:

Chemistry - Ch.15/16 Quiz



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

M=?
 n=
 L=

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

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

L=?
 m=
 n=

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

3) Find the molality of a solution made from dissolving 0.425 moles of sucrose (C₁₂H₂₂O₁₁) in 0.225 kg of water.

molal.=?
 n=
 kg=

$$\text{molal.} = \frac{n}{\text{kg}} = \frac{(0.425 \text{ mol})}{(.225 \text{ kg})} = 1.89 \text{ molal.}$$

4) The boiling point of an aqueous solution containing a nonvolatile electrolyte is 100.94 degrees Celsius.
 a. What is the boiling point elevation?
 b. What is the molality of the solution?

$\Delta t_b = 0.94^\circ\text{C}$
 $k_b = 0.51^\circ\text{C/molal.}$
 molal.=?

$$\text{molal.} = \frac{\Delta t_b}{k_b}$$

$\frac{(0.94^\circ\text{C})}{(0.51^\circ\text{C/molal.})} = 1.84 \text{ molal.}$

5) Find the freezing point depression when 0.479 moles of C₆H₁₂O₆ are added to 0.361 kg of water.

2nd

$\Delta t_f = ?$
 $k_f = -1.86^\circ\text{C/molal.}$
 molal = 1.33 molal

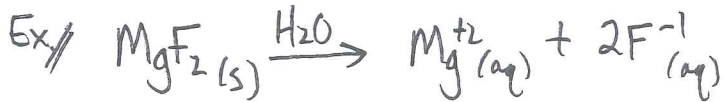
$$\Delta t_f = k_f \cdot \text{molal.} = (-1.86^\circ\text{C/molal.})(1.33 \text{ molal.}) = -2.47^\circ\text{C}$$

molal.=?
 $\text{molal.} = \frac{n}{\text{kg}} = \frac{(0.479 \text{ mol})}{(0.361 \text{ kg})} = 1.33 \text{ molal.}$

6) If 85.0mL of 4.00M HCl is diluted to a new volume of 275 mL, find the new Molarity of the solution. (HINT: C₁V₁=C₂V₂)

C₁=
 V₁=
 C₂=?
 V₂=

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



7) Write out dissolution reactions for:

- a. Sodium Chloride
- b. Potassium Sulfide
- c. Calcium Nitrate



8) In one BRIEF statement explain how each factor increases the rate of dissolution:

- a. Agitation ~ Bring fresh solvent in contact with solute
- b. Temperature ~ More collisions between solute + solvents
- c. Surface area ~ More contact between solute + solvent

9) Name the following hydrates:

- a. $K_2(SO_4) \cdot 3H_2O$ Potassium Sulfate trihydrate
- b. $AlCl_3 \cdot 5H_2O$ Aluminum Chloride pentahydrate
- c. $Fe_2O_3 \cdot 4H_2O$ Iron (III) Oxide tetrahydrate

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

	Suspension	Colloid	Solution
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 $Yb_2(SO_4)_3$
- 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 temp.

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

pers.

Bonus ~ TBA: Draw a giraffe

GO VIKINGS!!!