

Unit 8: Solutions PRACTICE Quiz Name _____ **KEY** _____

Answer Questions #1-4 based on the statement given below.

A 200 mL solution of iced tea is sweetened by adding 3 moles of sucrose ($C_{12}H_{22}O_{11}$).



- 1.) A homogeneous mixture was created.
(heterogeneous or homogeneous?)
- 2.) Which substance is the solute? sucrose
(sucrose or H_2O ?)
- 3.) Determine the *molarity* of the sucrose and water solution. Make sure to:
 - Give the correct equation to use
 - Show correct substitution into the equation
 - Solve for the answer with correct units

$$M = \frac{\text{moles of solute}}{\text{L of solution}} \quad M = \frac{3 \text{ mol sucrose}}{0.200 \text{ L solution}} \quad M = 15 \text{ OR } 15M$$

(notice changed from mL)

- 4.) How many grams is 3.0 moles of $C_{12}H_{22}O_{11}$?

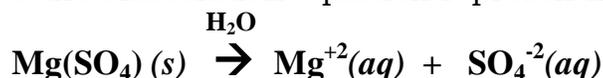
$$\begin{array}{r} \text{C: } 12 \times 12 \text{ g} = 144\text{g} \\ \text{H: } 22 \times 1 \text{ g} = 22\text{g} \\ \text{O: } 11 \times 16 \text{ g} = + 176\text{g} \\ \hline 342 \text{ g/mol} \end{array}$$

$$\frac{3 \text{ moles } C_{12}H_{22}O_{11}}{1 \text{ mole } C_{12}H_{22}O_{11}} \times \frac{342 \text{ g}}{1 \text{ mole } C_{12}H_{22}O_{11}} = 1026\text{g } C_{12}H_{22}O_{11}$$

- 5.) Is $C_{12}H_{22}O_{11}$ an electrolyte? If so is it an acid, base, or salt? How do you know?

No. It is covalent so it is not an electrolyte.

- 6.) When $Mg(SO_4)$ is mixed with water, does it dissolve? yes (yes or no)?
 - a) How many magnesium ions will form? 1 ...# of sulfate ions? 1
 - b) What is the charge on a magnesium ion? +2 ... on a sulfate ion? -2
 - c) Write the dissociation equation representing the dissolving of $Mg(SO_4)$:



- 7.) a.) Is $Mg(SO_4)$ an electrolyte? How do you know?
Yes. It is ionic and soluble and therefore conducts electricity when dissolved.

- b.) If it IS an electrolyte, is it an acid, base, or salt? salt

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It has neither an H⁺ ion, nor an OH⁻ ion in the chemical formula.

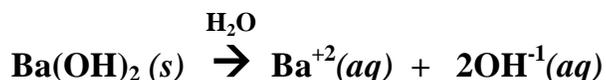
- For Questions #8-9:
- a.) Write the chemical formula.
 - b.) Determine if the compound is soluble or insoluble
 - c.) Write the dissociation equation if the compound is soluble.

8.) Barium hydroxide

a.) **Ba(OH)₂**

b.) **Soluble**

c.)



9.) Calcium Phosphate

a.) **Ca₃(PO₄)₂**

b.) **Insoluble**

c.) -----

10.) Is magnesium sulfate or barium hydroxide a better electrolyte? How do you know?

Barium hydroxide is a better electrolyte because it dissociates into more ions.

11.) In terms of particle attractions, why is a soluble substance able to dissolve in water?

A soluble substance is more attracted to the water than it is to itself, so the water is able to pull it apart (make it dissociate).

12.) Complete each equation by writing the two products formed. **Balance** and **include phases.**

