

Solutions

Section Quiz: Concentration of Solutions

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question.

- _____ 1. When preparing 500. mL of a 1.35 M aqueous solution of NaCl, what should you do after adding the correct amount of solute to a large beaker?
- Add 500. mL of water, and stir until solute dissolves.
 - Add 500. mL of water, dissolve solute, and add to a volumetric flask.
 - Add 400 mL of water, dissolve solute, add to a volumetric flask, add water to 500. mL mark, and mix thoroughly.
 - Add 400. mL of water, dissolve solute, add to a volumetric flask, add 100. mL of water, mix thoroughly, and transfer to another container.
- _____ 2. When preparing a 2.50 *m* aqueous solution of KOH, you correctly calculate that you need 140.3 g of KOH and 1.000 Kg (or 1.000 L) of water. What should you do after adding 140.3 g of KOH to a large beaker?
- Add 1000. mL of water, and stir until solute dissolves.
 - Add 900. mL of water, dissolve solute, add to a volumetric flask, and then add water to the 1000. mL mark.
 - Add 900. mL of water, dissolve solute, add to a volumetric flask, add water to 1000. mL mark and mix thoroughly.
 - Add 900 mL of water, dissolve solute, add to a volumetric flask, add water to 1000. mL mark, mix thoroughly, and transfer to another container.
- _____ 3. Which of the following is *not* used in preparing a 0.300 *m* aqueous solution of NaBr (molar mass = 102.89 g/mol) with 1.00 Kg of solvent?
- 0.300 mol water
 - 0.300 mol NaBr
 - graduated cylinder
 - 0.300 mol \times molar mass of NaBr
- _____ 4. Which of the following statements about concentration is true?
- A concentrated solution may be saturated.
 - A saturated solution may be dilute.
 - A dilute solution may be unsaturated.
 - All of the above

Section Quiz, *continued*

- _____ 5. In some instances, the concentration of a solution is expressed as molality instead of molarity because
- molality is easier to calculate.
 - molarity applies only to solid-liquid solutions.
 - molality does not change with changes in temperature.
 - molarity changes with the amount of solute and molality does not.
- _____ 6. How many grams of CaCl_2 (molar mass = 110.98 g/mol) are needed to prepare 1.00 L of a 1.00 M solution?
- 1.00 g
 - 40.08 g
 - 75.53 g
 - 110.98 g
- _____ 7. You know the mass of solute and the volume of solution. What is the first step in finding the molarity of the solution?
- Divide the mass by molar mass to determine number of moles.
 - Divide the mass by the volume of solution.
 - Divide the volume of solution by its mass.
 - Divide the number of moles by the volume of solution.
- _____ 8. A 0.15 M solution of HCl reacts with an excess of calcium carbonate, CaCO_3 . A volume of 25.0 mL of HCl is used. To determine the number of moles of CaCl_2 produced, you need to know
- the amount of the other product produced.
 - the molar mass of HCl.
 - the molar mass of CaCl_2 .
 - the balanced chemical equation for the reaction.
- _____ 9. A 0.100 M solution of copper(II) nitrate reacts with an excess of iron. What do you need to know to calculate the number of moles of iron(II) nitrate produced?
- the amount of the other product produced
 - the volume of solution
 - the molar mass of copper(II) nitrate
 - the molar mass of iron(II) nitrate
- _____ 10. Which of the following is *not* used in preparing 3.00 L of a 1.25 M aqueous solution?
- $(3.75 \text{ mol} \times \text{molar mass})$ of the solute
 - 3.75 mol of solute
 - $(3.00 \text{ L} \times \text{molar mass})$ of water
 - enough water to make 3.00 L of solution