Name: _____ Class: _____ Date: _____ ID: A

Chapter 16 Take Home Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1) Which of the following usually makes a substance dissolve faster in a solvent?
Ⓐ agitating the solution
Ⓑ increasing the particle size of the solute
Ⓒ lowering the temperature
Ⓓ decreasing the number of particles

____ 2) Which of the following expressions is generally used for solubility?
Ⓐ grams of solute per 100 grams of solvent
Ⓑ grams of solute per 100 milliliters of solvent
Ⓒ grams of solute per 100 grams of solution
Ⓓ grams of solute per 100 milliliters of solution

____ 3) Which of the following pairs of factors affects the solubility of a particular substance?
Ⓐ temperature and the nature of solute and solvent
Ⓑ temperature and degree of mixing
Ⓒ particle size and degree of mixing
Ⓓ particle size and temperature

____ 4) Which of the following occurs as temperature increases?
Ⓐ Solubility decreases.
Ⓑ Solubility increases.
Ⓒ Solubility remains the same.
Ⓓ Molarity doubles.

____ 5) What happens to the solubility of a gas, in a liquid, if the partial pressure of the gas above the liquid decreases?
Ⓐ The solubility decreases.
Ⓑ The solubility increases.
Ⓒ The solubility remains the same.
Ⓓ The solubility cannot be determined.

____ 6) Which of the following operations yields the number of moles of solute?
Ⓐ molarity × moles of solution
Ⓑ molarity × liters of solution
Ⓒ molarity × mass of solution
Ⓓ moles of solution ÷ volume of solution

____ 7) What is the molarity of 200 mL of solution in which 2.0 moles of sodium bromide is dissolved?
Ⓐ 2.0*M*
Ⓑ 10*M*
Ⓒ 0.40*M*
Ⓓ 4.0*M*

____ 8) What mass of Na_2SO_4 is needed to make 2.5 L of 2.0*M* solution? (Na = 23 g; S = 32 g; O = 16 g)
Ⓐ 178 g
Ⓑ 284 g
Ⓒ 356 g
Ⓓ 710 g

____ 9) What does NOT change when a solution is diluted by the addition of solvent?
Ⓐ volume of solvent
Ⓑ mass of solvent
Ⓒ number of moles of solute
Ⓓ molarity of solution

____ 10) How many mL of a 2.0*M* NaBr solution are needed to make 200.0 mL of 0.50*M* NaBr?
Ⓐ 25 mL
Ⓑ 50 mL
Ⓒ 100 mL
Ⓓ 150 mL

____ 11) If 2.0 mL of 6.0*M* HCl is used to make a 500.0-mL aqueous solution, what is the molarity of the dilute solution?
Ⓐ 0.024*M* Ⓒ 0.30*M*
Ⓑ 0.24*M* Ⓓ 0.83*M*

____ 12) In which of the following is concentration expressed in percent by volume?
Ⓐ 10% (v/v) Ⓒ 10% (m/m)
Ⓑ 10% (m/v) Ⓓ 10%

____ 13) If the percent (mass/mass) for a solute is 4% and the mass of the solution is 200 g, what is the mass of solute in solution?
Ⓐ 8.0 g Ⓒ 80 g
Ⓑ 50 g Ⓓ 800 g

____ 14) Which of the following is NOT a colligative property of a solution?
Ⓐ boiling point elevation Ⓒ vapor pressure lowering
Ⓑ supersaturation Ⓓ freezing point depression

____ 15) Which of the following is an expression of molality?
Ⓐ $\frac{10\,\text{mol of solute}}{1\,\text{kg of solvent}}$ Ⓒ $\frac{10\,\text{mol of solute}}{1\,\text{L of solvent}}$
Ⓑ $\frac{10\,\text{mol of solute}}{1\,\text{L of solution}}$ Ⓓ $\frac{10\,\text{mol of solute}}{1\,\text{kg of solution}}$

____ 16) What is the number of kilograms of solvent in a 0.70 molal solution containing 5.0 grams of solute? (molar mass of solute = 30 g)
Ⓐ 0.24 kg Ⓒ 0.11 kg
Ⓑ 2.4 kg Ⓓ 1.1 kg

____ 17) What is the freezing point of a solution of 0.5 mol of LiBr in 500 mL of water? (K_f = 1.86°C/*m*)
Ⓐ –1.86°C Ⓒ –5.58°C
Ⓑ –3.72°C Ⓓ –7.44°C

____ 18) What is the boiling point of a solution that contains 3 moles of KBr in 2000 g of water? (K_b = 0.512°C/*m*; molar mass of water = 18 g)
Ⓐ 97°C Ⓒ 101.4°C
Ⓑ 99.7°C Ⓓ 103°C

____ 19) What is the molality of a solution of water and KCl if the freezing point of the solution is –3°C? (K_f = 1.86°C/*m*; molar mass of water = 18 g)
Ⓐ 0.6*m* Ⓒ 0.8*m*
Ⓑ 1.2*m* Ⓓ 6*m*

____ 20) What is the approximate molar mass of a molecular solute if 300 g of the solute in 1000 g of water causes the solution to have a boiling point of 101°C? (K_b = 0.512°C/m; K_f = 1.86°C/*m*; molar mass of water = 18 g)
Ⓐ 15 amu Ⓒ 150 amu
Ⓑ 30 amu Ⓓ 300 amu