Name _____ Class _____ Date _____

Assessment

Ions in Aqueous Solutions and Colligative Properties

Section Quiz: Colligative Properties 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.** Why is freezing-point depression a colligative property?
- **a.** It is inversely proportional to the number of particles in a solution.
- **b.** It is directly proportional to the number of particles in a solution.
- **c.** It depends on the properties of an electrolyte in a solvent.
- **d.** None of the above

_____ **2.** Compared with a 0.01 M $C_6H_{12}O_6$ solution, a 0.01 M KCl solution has
- **a.** the same freezing-point depression.
- **b.** about twice the freezing-point depression.
- **c.** the same freezing-point elevation.
- **d.** about six times the freezing-point elevation.

_____ **3.** Compared with a 1.00 M NaI solution, a 1.00 M Na_2SO_4 solution has
- **a.** the same boiling-point elevation.
- **b.** about twice the boiling-point elevation.
- **c.** a boiling-point elevation about two-thirds as high.
- **d.** a boiling-point elevation about 1.5 times as high.

_____ **4.** When a nonvolatile solute dissolves in a solvent, the vapor pressure of the solvent
- **a.** increases.
- **b.** decreases.
- **c.** stays the same.
- **d.** changes depending on the solvent used.

_____ **5.** Which of the following compounds would be most effective in lowering the melting point of ice on roads?
- **a.** $CaCl_2$
- **b.** NaCl
- **c.** K_3PO_4
- **d.** K_2SO_4

_____ **6.** In concentrated electrolytic solutions, the attraction between dissolved ions results in
- **a.** higher than expected freezing points.
- **b.** higher than expected boiling points.
- **c.** lower than expected vapor pressure.
- **d.** lower than expected effective concentrations.

_____ **7.** What is the boiling-point elevation of a 2.0 m glucose solution in water? ($K_b = 0.51°C/m$)
- **a.** 0.26°C
- **b.** 0.51°C
- **c.** 1.02°C
- **d.** 98.98°C

_____ **8.** What is the molal concentration of a sucrose solution whose freezing point is −2.00°C? ($K_f = -1.86°C/m$)
- **a.** 0.26 m
- **b.** 1.08 m
- **c.** 3.65 m
- **d.** 3.72 m

_____ **9.** Compared with a 1.0 m sucrose solution in water ($K_b = 0.51°C/m$, $K_f = -1.86°C/m$), a 1.0 m sucrose solution in acetic acid ($K_b = 3.07°C/m$, $K_f = -3.90°C/m$) has
- **a.** the same boiling-point elevation.
- **b.** a lower boiling-point elevation.
- **c.** a larger freezing-point depression.
- **d.** a smaller freezing-point depression.

_____ **10.** A carrot shrinks after being placed in a concentrated NaCl solution. This is an example of
- **a.** freezing-point depression.
- **b.** osmosis.
- **c.** boiling-point elevation.
- **d.** vapor pressure elevation.