

Practice Quiz: Solutions and Colligative Properties

Name _____

- Which of the following aqueous solutions will have the lowest freezing point:
 - 0.1 m sodium chloride
 - 0.2 m sucrose
 - 0.1 m aluminum nitrate
 - All of these solutions freeze at the same temperature
- Determine the molar mass of an ionic substance with a van't Hoff factor of 2.000 using the following data: 29.25 g of the substance is dissolved in 1.000 kg of water and the freezing point of the solution is measured to be $-1.860\text{ }^{\circ}\text{C}$. (The K_f for water is $1.860\text{ }^{\circ}\text{C}/\text{m}$).
 - 1.000
 - 2.000
 - 58.50
 - 29.25
 - 1.860
- What is the boiling point of a 4.00 molal solution of potassium chloride in water? (The K_b for water is $0.5000\text{ }^{\circ}\text{C}/\text{m}$)
 - 373 K
 - 369K
 - 273 K
 - 377 K
 - none of these
- Benzene has a higher vapor pressure than Toluene. Which compound has the higher boiling point?
 - Benzene
 - Toluene
 - It is not possible to determine this from the given information
- If 10.0 grams of ethanol (molar mass = 46 g/mol) are mixed with 15 grams of water, what is the mole fraction of ethanol in the mixture?
 - 0.21
 - 0.67
 - 0.26
 - 1.5
 - none of these
- The vapor pressure of a pure substance is measured to be 812 mmHg at a specific temperature. A non-volatile solute is added to this substance and the vapor pressure is measured to be 400. mmHg. What is the mole fraction of the non-volatile solute?
 - 0.493
 - 0.507
 - 2.03
 - 2.97
 - 0.970
- At 25°C the osmotic pressure of a 0.0100 M solution of a compound is 0.466 atm. Calculate the approximate van't Hoff factor.
 - 1
 - 2
 - 3
 - 4
 - 5
- Calculate the molality of a solution that contains 5.00 g of naphthalene, C_{10}H_8 , in 100. mL of carbon tetrachloride. (The density of pure carbon tetrachloride is 1.58 g/mL)
 - 0.050
 - 0.247
 - 0.0862
 - 0.0247
 - 0.025
- Calculate the boiling point of a solution of 215.0 g of magnesium bromide dissolved in 800.0 g of water. (The K_b for water is $0.5000\text{ }^{\circ}\text{C}/\text{m}$)
 - 373.0 K
 - 377.8 K
 - 273.0 K
 - 368.2 K
 - none of these
- List the four colligative properties and, in a short sentence, state what "colligative property" means.