

Name: _____

Date: _____

Worksheet # 3 (Chapter 13)

- 1) The vapor pressure of pure ethanol at 60 °C is 0.459 atm. Raoult's Law predicts that a solution prepared by dissolving 10.0 mmol naphthalene (nonvolatile) in 90.0 mmol ethanol will have a vapor pressure of _____ atm.
A) 0.498 B) 0.413 C) 0.790 D) 0.367 E) 0.0918
- 2) The vapor pressure of pure water at 25 °C is 23.8 torr. What is the vapor pressure (torr) of water above a solution prepared by dissolving 18.0 g of glucose (a nonelectrolyte, MW = 180.0 g/mol) in 95.0 g of water?
A) 24.3 B) 23.4 C) 0.451 D) 0.443 E) 23.8
- 3) The vapor pressure of pure water at 25 °C is 23.8 torr. Determine the vapor pressure (torr) of water at 25 °C above a solution prepared by dissolving 35 g of urea (a nonvolatile, non-electrolyte, MW = 60.0 g/mol) in 75 g of water.
A) 2.9 B) 3.3 C) 21 D) 27 E) 0.88
- 4) The freezing point of ethanol (C₂H₅OH) is -114.6 °C. The molal freezing point depression constant for ethanol is 2.00 °C/m. What is the freezing point (°C) of a solution prepared by dissolving 50.0 g of glycerin (C₃H₈O₃, a nonelectrolyte) in 200 g of ethanol?
A) -115 B) -5.42 C) -132.3 D) -120.0 E) -114.6
- 5) What is the freezing point (°C) of a solution prepared by dissolving 11.3 g of Ca(NO₃)₂ (formula weight = 164 g/mol) in 115 g of water? The molal freezing point depression constant for water is 1.86 °C/m.
A) -3.34 B) -1.11 C) 3.34 D) 1.11 E) 0.00
- 6) A solution containing 10.0 g of an unknown liquid and 90.0 g water has a freezing point of -3.33 °C. Given $K_f = 1.86^\circ\text{C}/\text{m}$ for water, the molar mass of the unknown liquid is _____ g/mol.
A) 69.0 B) 333 C) 619 D) 161 E) 62.1
- 7) Calculate the freezing point (0°C) of a 0.05500 m aqueous solution of glucose. The molal freezing-point-depression constant of water is 1.86 °C/m.
A) 0.0286 B) 0.1023 C) -0.05627 D) -0.1023 E) -0.2046
- 8) Calculate the freezing point (0°C) of a 0.05500 m aqueous solution of NaNO₃. The molal freezing-point-depression constant of water is 1.86 °C/m.
A) 0.0286 B) -0.1023 C) 0.1023 D) -0.05627 E) -0.2046
- 9) A 0.15 m aqueous solution of a weak acid has a freezing point of -0.31 °C. What is the percent ionization of this weak acid at this concentration? The molal freezing-point-depression constant of water is 1.86 °C/m.
A) 17 B) 11 C) 89 D) 31 E) 35