

Participation Assignment

CHEM 1100-General Chemistry II

Name:

#2

Section: 31, TR

Due Date: Thursday 1/10/2019

1. At 79.6 °C the vapor pressure of pure water is 0.466 bar while the vapor pressure of pure ethanol is 1.066 bar.

a. What is the vapor pressure of an aqueous solution that has a 0.500 mole fraction of ethanol? Assume the mixture follows Raoult's law.

b. If the actual vapor pressure of the ethanol/water solution is 1.013 bar, does the mixture follow Raoult's law?

2. Ethylene glycol, $C_2H_6O_2$, is a nonvolatile nonelectrolyte and is commonly added to water and used as both a coolant and an antifreeze in radiators. Use the molality of the aqueous 52.0 % (by mass) ethylene glycol solution calculated previously and calculate both the freezing point and boiling point of this solution. Assume water boils at 100.00 °C and freezes at 0.0 °C.

3. What is the molarity of an aqueous hydrochloric acid solution that is 37.0 % (by mass) HCl?

4. A solution is prepared by dissolving 35.0 g hemoglobin in enough water to make 1.00 L of solution. If the osmotic pressure is 0.0132 atm at 25 °C, what is the molar mass of hemoglobin?

	0.100 m	0.0100 m	0.00100 m	Limiting Value
Sucrose				
NaCl				
MgSO₄				
K₂SO₄				

Data: Brown, LeMay, Bursten, *Chemistry: The Central Science*, 9th ed., Pearson Education, Inc, 2003, p511.

5. Arrange the following according to decreasing freezing point: 0.10 m sucrose (a nonelectrolyte), 0.10 m hydrochloric acid, 0.10 m acetic acid.