Vasquez High School -- AP Chemistry -- Exam #3 -- Chapter 12 -- 80 points

Short Answer/Fill-in. Be neat and complete. Three points each.

1) Two liquids are said to be _____ if they are completely soluble in each other.

2) A dispersion of particles of one substance throughout the dispersing medium of a second substance is called a(n) _____.

3) A liquid that does not have an appreciable vapor pressure is said to be _____.

4) Raoult's Law is given by: _____

5) The process by which an ion or molecule is surrounded by solvent molecules is _____.

Five points each.

6) Describe the difference between unsaturated, saturated and supersaturated solutions: _____

_____

_____

_____.

7) Define Henry's Law. Give its equation. Then give an example. _____

_____

_____.

8) Distinguish between the terms isotonic, hypertonic, and hypotonic. _____

_____

_____.

9) In general, what are colligative properties? _____

_____

_____.

10) Describe the fractional distillation process. _____

_____

_____.

Calculation Section. Write all equations where applicable. Label all answers. Show your work. Five points.

11) The normal freezing point of acetic acid is 16.6 °C. It freezing point depression constant is 3.90 °C/m. What is the molality of a sucrose solution if the freezing point of it is 11.4 °C?

12) Find the molarity of a solution of magnesium nitrate, $Mg(NO_3)_2$, if 43.9 g is dissolved in 350 mL solution.

13) The molality of a solution made of sodium chloride in ethanol, C_2H_5OH, is 0.375 m. How much salt is dissolved in 650 g of the alcohol, that is, how many grams of NaCl?

14) The concentrated sulfuric acid we use in the lab is 98.0% H_2SO_4 by mass. Calculate the molality and molarity of the acid solution if its density is 1.83 g/mL.

Ten points on these.

15) How many grams of sucrose ($C_{12}H_{22}O_{11}$) must be added to 732 g of water to give a solution with a vapor pressure 3.0 mmHg less than that of pure water at 20 °C? The v.p. of water at 20 °C is 17.5 mmHg.

16) At 25 °C, the vapor pressure of pure water is 23.76 mmHg. When a certain amount of ammonium chloride, NH_4Cl, is added, the vapor pressure is reduced to 22.47 mmHg. Find its molal concentration if the Van't Hoff constant for ammonium chloride is 5% less than expected.