1. Predict the solubility of the following:

a. benzene in ammonia

b. potassium nitrate in methanol

c. isopropanol in acetone

d. iodine in hexane

e. chlorine in water

2. At 20.0oC and 1.00 atm, 7.6 mg/L of oxygen dissolve in water.

a. What is the Molarity of the solution?

b. Find the Henry's law constant for oxygen.

c. How much oxygen would dissolve in water at 10.0oC exposed to air?

3. 5.00 g of glucose (C6H12O6) are dissolved in 120.0 mL of water (density = 1 g/mL) at 25.0oC.

a. Find the mass percent.

b. Find the mole fraction.

c. Find the Molarity.

d. Find the molality.

e. What is the vapor pressure of the solution?

f. What is the boiling point of the solution?

g. What is the freezing point of the solution?

h. What is the osmotic pressure of the solution?

4. The maximum solubility of sodium chloride in water is 39.5 g in 100 g of water at 25.0oC.

a. Find the mass percent.

b. Find the mole fraction.

c. Find the Molarity.

d. Find the molality.

e. What is the vapor pressure of the solution?

f. What is the boiling point of the solution?

g. What is the freezing point of the solution?

h. What is the osmotic pressure of the solution?

5. 12.0 g of an unknown nonelectrolyte dissolves in water and the resulting solution has a freezing point of -3.45oC. What is the molar mass of the unknown nonelectrolyte?