1125 Review Session

Q center

Exam 4

1. What mass of $CuBr_2$ is needed to prepare 750.0 mL of 1.25 M solution?

2. A solution is made by dissolving 170.1 g of glucose ($C_6H_{12}O_6$) in enough water to make a liter of solution. The density of the solution is 1.062 g/mL. Express the concentration in (a) molality, (b) percent by mass, (c) molarity.

3. An aqueous solution is prepared by diluting 3.30 mL acetone CH_3COCH_3, (d = 0.789 g/mL) with water to a final volume of 75.0 mL. The density of the solution is 0.993 g/mL. What are the molarity and molality of acetone in this solution?

4. How many grams of oxygen can be dissolved in 1.00 L of water at 20℃ if the oxygen pressure is 2.00 atm? The Henry's law constant for oxygen at 20℃ is 1.38×10^{-3} M/atm.

5. Calculate the vapor pressure of water over a solution made by dissolving 225 g of glucose in 575 g of water at 35^{o}C (At 35 ^{o}C, $P°water$= 42.2 mmHg.)

6. An aqueous solution of 10.00 g of catalase, an enzyme found in the liver, has a volume of 1.00 L at 27°C and an osmotic pressure of 0.74 mmHg. What is the molar mass of the catalase?

7. Consider chloroform ($CHC\ell_3$) boils at 61.7°C.
    a. A solution prepared by dissolving 0.146 mol of a nonelectrolyte in 197 g of chloroform boils at 64.4°C. What is the boiling point constant (k_b) for chloroform.

    b. In another experiment, a solution of an unknown electrolyte is prepared in chloroform. Its concentration is 0.462 m. The solution boils at 66.7°C. What is i (the Van't Hoff factor) for the electrolyte?

8. An aqueous solution of LiX is prepared by dissolving 3.58 g of the electrolyte in 283 mL of H_2O (d=1.00 g/mL). The solution freezes at -1.81 °C. What is the identity of the unknown element X? (Assume complete dissociation of LiX to Li^+ and X^-). The freezing point depression constant of water is 1.86 °C/m.