

Chemistry 122 – Recitation Activity 4B/5A (Ch. 13.5-6)

Read over the handout on labs, p. 5, for hints on graphing! (before expt. XRD reports are done).

1. Determine the vapor pressure of a solution containing 75.0 g heptane and 25.0 g octane at 100°C. What is the composition of the vapor in equilibrium with the solution at 100°C ?
Data: heptane C_7H_{16} 100 g/mol $P^\circ = 791$ torr
 octane C_8H_{18} 114 g/mol $P^\circ = 352$ torr
2. A solution of 0.640 g of azulene in 100.0 g of benzene boils at 80.23°C. The boiling point of benzene is 80.10°C; the K_b is 2.53 °C/molal. What is the molecular weight of azulene?
3. Which of the following solutions should have the highest boiling point?
 - a. 0.02 m KNO_3
 - b. 0.02 m NaCl
 - c. 0.012 m $Ce(NO_3)_4$
 - d. 0.012 m $ScCl_3$
 - e. 0.012 m $(NH_4)_2SO_4$.
4. Pepsin is an enzyme present in the digestive tract. A solution of 0.500 g of pepsin in 30.0 mL of benzene has an osmotic pressure of 8.92 torr at 27°C. What is the molecular weight of pepsin?
5. A 0.0311 m solution of $FeCl_3$ in water freezes at -0.206°C. What is the van't Hoff factor i for $FeCl_3$? Is this the ideal value of i ? If not, why not?
6. Given your knowledge of colloids, explain how detergents work for removing fats from your dishes.

Next week's activity will be on Ch. 14.1-4. Note that the quiz next week covers Ch. 13 and 14.1-4, and that I took out the material from the parts of Midterm I that you covered from this activity.