Worksheet 6

1. a) What is the significance of the critical point in a phase diagram? b) Why does the line that separates the gas and liquid phases end at the critical point?

2. When two nonpolar organic such as hexane (C_6H_{14}) and heptane(C_7H_{16}) are mixed the enthalpy change that occurs is generally quite small. Given that $\Delta H_{sol} \approx 0$, explain why hexane and heptane spontaneously form a solution.

3. Indicate the principal types of solute-solvent interaction in each of the following solutions, and rank the solutions from weakest to strongest solute-solvent interaction: a) KCl in water, b) CH_2Cl_2 in benzene (C_6H_6), c) methanol (CH_3OH) in water.

4. A solution is made containing 25.5 g of phenol (C_6H_5OH) in 495 g of ethanol (CH_3CH_2OH). Calculate a) the mole fraction of phenol, b) the mass percent of phenol, c) the molality of phenol.