Chemistry 236 -- Practice Quiz 8
November 5, 2003 — Binary Liquid-Vapor Equilibrium

1. TRUE/FALSE:

   a. The activity a_i is never negative.
   b. The activity coefficient γ_i is never negative.
   c. In an ideal binary liquid solution of A and B, A-B interactions are negligible.
   d. When 30.0 mL of 3.0 M HCl (*aq*) is added to 50.0 mL of 1.0 M HCl (*aq*), the final volume will be 80.0 mL.

2. For each of the following solutions, state whether each component will approximately obey Raoult's Law, Henry's Law, or neither: [A = CCl_4, B = CH_3OH, C = $SiCl_4$]

   a. $x_A = 0.5$; $x_B = 0.5$
   b. $x_A = 0.99$; $x_B = 0.01$
   c. $x_A = 0.01$; $x_B = 0.99$
   d. $x_A = 0.4$; $x_C = 0.6$

3. Benzene and toluene form nearly ideal solutions. At 25°C the vapor pressure of pure benzene and pure toluene are 95.1 torr and 28.4 torr, respectively. What is the mole fraction of benzene in the <u>liquid</u> in equilibrium with vapor having mole fraction $x_{benzene} = 0.40$ at 25°C?

   a. 0.40   b. 0.30   c. 0.23   d. 0.17   e. none of these