**King Fahd University of Petroleum & Minerals**
**Chemical Engineering Department**
**CHE 303 – Chemical Engineering Thermodynamics II**
**2009 - 2010 (091)**

**HW#8**
Due: Sat. 26-Dec-2009

## Q1. (20 points)

One mole of benzene (1) is mixed with 3 moles of toluene (2) at 102 $^{o}$C and 1 bar. If **Raoult's law** is adequate to describe the VLE of this system, perform the following:

(a) Show that this solution forms a two phase system.
(b) Calculate the fraction of vapor.
(c) Calculate the composition of the vapor phase.

## Q2. (20 points)

A 10 mol/s equimolar mixture of *Benzene*(1)/*Toluene*(2) is brought to 90 °C to form a two phase system then flashed in a flash drum. Assuming that **Raoult's law** is adequate to describe the VLE of this system and if 45% of the feed is evaporated, calculate the following:

(a) The pressure of the drum.
(b) The composition of the vapor.
(c) The composition of the liquid.