

Homework 9
due October 30, 2008

If you find yourself without enough information, make and justify a reasonable approximation. Please answer all parts of a question! (This is good practice for an exam setting.)

1. Which phase(s) is/are present after each process, and why?

- (a) (3 points) Toluene is heated to 100°C and 1 atm (absolute).
- (b) (3 points) Ethyl acetate is brought to 79°C and 1 atm (absolute).
- (c) (3 points) 1 mol of ethyl alcohol at 1 atm is warmed to 78.5°C , and then 10 kJ of heat is added.

Use figures in the chapter to answer the next three parts.

- (d) A mixture of 7 mol benzene and 3 mol toluene is heated to 80°C at 1 atm (absolute). Report the composition of the phase(s) and explain why.
 - (e) A mixture of 7 mol benzene and 3 mol toluene is heated to 90°C at 1 atm (absolute). Report the composition of the phase(s) and explain why.
 - (f) Felder and Rousseau, "Test Yourself" # 2, p 274
2. Calculate the bubble point pressure for a benzene-toluene system with a benzene liquid-phase mole fraction of 0.3 at 100°C . Compare your answer to the results on a graph in the chapter.
3. Calculate the dew point temperature for a benzene-toluene system with a benzene vapor-phase mole fraction of 0.8 at 1 atm. Compare your answer to the results on a graph in the chapter.
4. Felder and Rousseau, problem 6.9
5. Felder and Rousseau, problem 6.46