ChEn 3603 Homework 7

Problem 1 (10 pts)

Using the *T*-*x*-*y* data for Methanol-Water in SHR Table 4.1(b), answer the questions below.

1. (2 pts) A mixture of 70 mol% methanol is brought to its dew point. What is its temperature, and what is the composition of the first droplet that forms? Also show your results graphically on a *T*-*x*-*y* diagram.

2. (2 pts) For the mixture composition from part 1, what is the bubble point temperature and the composition of the first bubble? Also put this on your T-x-y figure from part 1.

3. (3 pts) If the mixture from part 1 is condensed until 80% of the mixture is vapor, what is the corresponding temperature and composition of the vapor and liquid? Do this using the *T*-*x*-*y* diagram and the inverse lever arm rule.

4. (3 pts) Repeat part (3) using the *q*-line. Plot the results on an *x*-*y* diagram.

Problem 2 (10 pts)

Repeat all of problem 1 for a feed of 30% methanol. For part 3, use 20% instead of the 80% you did in problem 1.

Problem 3 (12 pts)

SHR 4.6 (3rd edition) - partial vaporization of a nonideal binary mixture

Only do parts (a)-(e).