

CM2120 Fundamentals of Chemical Engineering 2
Department of Chemical Engineering
Michigan Technological University

Homework 3
Due 11 February 2009

1. Multicomponent Flash Separation (20 points)

Wankat Problem D16 (in Chapter 2)

2. Multicomponent Flash Separation Tutorial and Problem in UniSim (20 points)

- a. Work through the example problem described below.
- b. Use this procedure to estimate a solution to problem 1 in this homework set.

3. Winter Carnival (10 points)

What is the name of the large statue between the Chem-Sci and EERC (visible from JMK's office)?

Tutorial: Performing Flash Distillation in UniSim

In this tutorial we will apply UniSim process simulation software to example problem 2.2 from Wankat.

1. Read Example 2-2 on pages 37-39 of Wankat.
2. Start UniSim, by clicking the start button, then Programs, then CM Apps, then UniSim Design Suite, then UniSim Design.
3. After the program launches, select File, then New, then Case.
4. View the Master Component List, select propane, and then click on "Add Pure." Repeat for the other components in the problem. Then close the window by clicking on the red X.
5. Select the "Fluid Pkgs" tab and Add Antoine. Then click on the red X and then click on the "Enter Simulation Environment" button.
6. Make the window bigger by putting the cursor over the lower right corner and dragging it down and to the right.
7. Select the blue arrow and place anywhere on the screen.
8. Right click on the arrow and select "View Properties"
9. Enter the given temperature, pressure, and molar flow. Then click on composition and enter the given values. Select ok.
10. You should now click on conditions and move the slider bar to the right to obtain the vapor / phase fraction and liquid / phase fraction. What are they? How do they compare with the book?
11. You should now click on composition and move the slider bar to the right to obtain the vapor phase and liquid phase compositions. What are they? How do they compare with the book?
12. Select from the top menu "Tools", then "Reports." Select "Create," then "Insert Datasheet," then select "1" (stream number), then "Add." Click on the red X twice, then select Preview. Make sure you can see the compositions of liquid and vapor and then print your output.
13. Repeat for the conditions for problem 1 in this homework set.

Note that to access the UniSim manual, please click on the start button, then run, then type: P:\UniSim\R380\Documentation\USD\UniSim Design Menu.pdf