

ChE3063 Homework Set #3

Due: September 30, 2020

Using 1) Raoult's Law, and 2) HYSYS, solve the following:

For a liquid mixture of 10 mole% n-hexane, 15 mole% n-heptane, 30 mole% benzene and 45 mole% toluene, calculate the bubble point temperature at 200 psia and determine the composition of the vapor. Compare the Raoult's Law result to HYSYS.

For the HYSYS solution, use the Peng-Robinson equation of state. Rather than turning in the HYSYS file, take a screen shot of the HYSYS conditions window, and the composition window showing the liquid and vapor compositions and turn the hardcopy in. See examples of the two windows below:

Feed Stream Properties

Property	Value
Stream Name	Feed
Vapour / Phase Fraction	<empty>
Temperature [C]	<empty>
Pressure [kPa]	<empty>
Molar Flow [kgmole/h]	<empty>
Mass Flow [kg/h]	<empty>
Std Ideal Liq Vol Flow [m3/h]	<empty>
Molar Enthalpy [kJ/kgmole]	<empty>
Molar Entropy [kJ/kgmole-C]	<empty>
Heat Flow [kJ/h]	<empty>
Liq Vol Flow @Std Cond [m3/h]	<empty>
Fluid Package	Basis-1
Utility Type	

Vapor Stream Properties

Component	Mole Fractions	Vapour Phase	Liquid Phase
Ethane	0.698008	0.698008	0.501327
Propane	0.301992	0.301992	0.498673
n-Butane	0.000000	0.000000	0.000000
n-Pentane	0.000000	0.000000	0.000000
n-Hexane	0.000000	0.000000	0.000000

Total: 1.00000

Buttons: Edit..., Edit Properties..., Basis..., Extend Stream Functionality