

Answer Sheet for CHE654 Homework Set #3 (100 Points)

21. Using ASPEN PLUS to Perform Simple Calculations (20 points)

Answer the following questions:

(a) (i) At $P = 1.01325$ bar (1 atm):

Bubble point temperature of the mixture = _____ °C

Dew point temperature of the mixture = _____ °C

(ii) At $T = 100$ °C:

Bubble point pressure of the mixture = _____ bar

Dew point pressure of the mixture = _____ bar

(iii) Temperature at which the flash will produce a vapor stream containing

exactly 50 mol% acetone = _____ °C

(b) Composition (mass fractions) of the benzene-toluene feed = _____

22. Simulation of a Cyclohexane Production Process (20 points)

Answer the following questions:

1. Pressure of the column condenser = _____ psia

2. Purge fraction = _____

3. Temperature of the flash vessel = _____ °F

4. Purity of cyclohexane (mole%) in the product stream = _____ %

24. Simulating an Acetone Production Process (30 points)

Answer the following questions:

1. ΔP across the reactor = _____ psia
2. % conversion of the reaction based on IPA = _____ %
3. Temperature of the condenser in Column-1 = _____ °F
4. Product purity (mole%) of acetone in liquid distillate of Column-1 = _____ %

26. Solving a Highly Constrained Toluene Production Problem with A+ (30 points)

Answer the following questions:

1. Total flow rate of Stream FEED = _____ lbmol/hr
2. Flow rate of cooling water = _____ lbmol/hr
3. Reactor length = _____ feet
4. Vapor fraction in Stream LITE-GAS = _____
5. Purity of toluene in the product stream TOLUENE = _____ mole%