

Answer Sheets for CHE654 Homework Set #5 (100 Points)

Note: For all problems, submit a copy of your process flow diagram and a copy of your input summary of the process.

36. (20 points) *Extracting Compound Y via an Evaporator and a Stripper Using Compound X*

Answer the following questions:

Required heat transfer area of the evaporator = _____ ft²

Concentration of Compound Y in the liquor stream from the evaporator = _____ mol%

Concentration of Compound Y in the outlet liquid stream of the stripper = _____ mol%

37. (20 points) *Separation of Compound X, II*

Answer the following questions:

(a) Redundant parameters: _____

(b) Column bottom flow rate = _____ lbmol/hr

Distillate vapor flow rate = _____ lbmol/hr

39. (20 points) *Property Requirements and PCES, II*

(a) Required parameters:

(b) Values of estimated parameters:

MW = _____ ; T_C = _____ K; P_C = _____ N/m²

- $Z_C =$ _____; CPIG at 300 K = _____ J/kmol-K
- DHFORM = _____ J/kmol; DGFORM = _____ J/kmol
- OMEGA = _____; DHVLB = _____ J/kmol
- VB = _____ m^3/kmol
- (c) $H_V^{IG} =$ _____ Btu/lbmol
- $H_L =$ _____ Btu/lbmol
- (d) Tdew at 1 atm = _____ °C
- Tdew at 50 atm = _____ °C

41. (20 points) *Recovering Acetone from a Wastewater Stream*

Answer the following questions:

D:F molar ratio in Column 1 = _____

Purity of acetone product stream = _____ mole%

42. (20 points) *Extractive Distillation, II*

Answer the following questions:

Mole % purity of butene in the distillate of the extractive column = _____

Mole % purity of butadiene in the distillate of the solvent recovery column = _____