

Answer Sheet for CHE654 Homework Set #5 (100 points)

31. (20 points) *Double-Effect Evaporator*

- (a) The required physical property parameters for sugar in IDEAL are

The redundant data are: _____

- (b) The mass fraction of sugar from the concentrated liquor of the second evaporator

= _____

32. (20 points) *Separation of Compound X*

- (a) Redundant parameters: _____

Required but missing parameters: _____

- (b) Thermal diffusivity of column bottom stream = _____ cs

Column bottom flow rate = _____ lbmol/hr

35. (30 points) *Property Requirements and PCES, I*

- (a) Required parameters in UNIQU-RKS are:

(c) Compute CPIG:

CPIG at $T = 500\text{ }^{\circ}\text{F} =$ _____ Btu/lbmol-R

CPIG at $T = 32\text{ }^{\circ}\text{F} =$ _____ Btu/lbmol-R

(d) Compute enthalpy H:

H_{IG}^V at $T = 500\text{ }^{\circ}\text{F} =$ _____ Btu/lbmol

H_{IG}^L at $T = 500\text{ }^{\circ}\text{F} =$ _____ Btu/lbmol

(e) Two more property methods that are appropriate are: _____

37. (30 points) Extractive Distillation, I

(a) Mole purity of MCH in the overhead stream of the first column = _____
mole%

Mole purity of toluene in the overhead stream of the second column = _____
mole%

(b) The final value of D/F ratio in the second column = _____