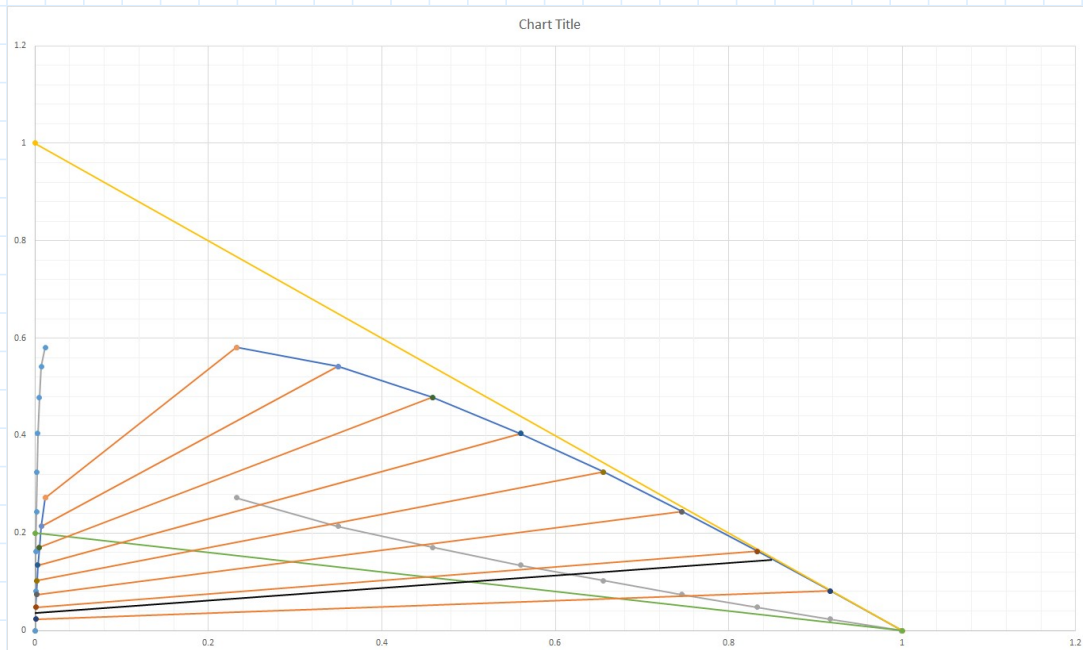


$kmol := 1000 \text{ mol}$

Part a)



$$T := 25 \text{ } ^\circ\text{C} \quad x_{FA} := 20\% \quad F := 200 \frac{kmol}{hr}$$

$$x_S := 0 \quad x_A := 0.06 \quad y_{MS} := 0.5 \quad y_S := 0.825 \quad y_A := 0.143$$

$$MV := y_S - y_{MS} = 0.325 \quad LM := y_{MS} - x_S = 0.5$$

$$x_C := 1 - x_S - x_A = 0.94 \quad y_C := 1 - y_S - y_A = 0.032 \quad M := 400 \frac{kmol}{hr}$$

Solver Constraints Values

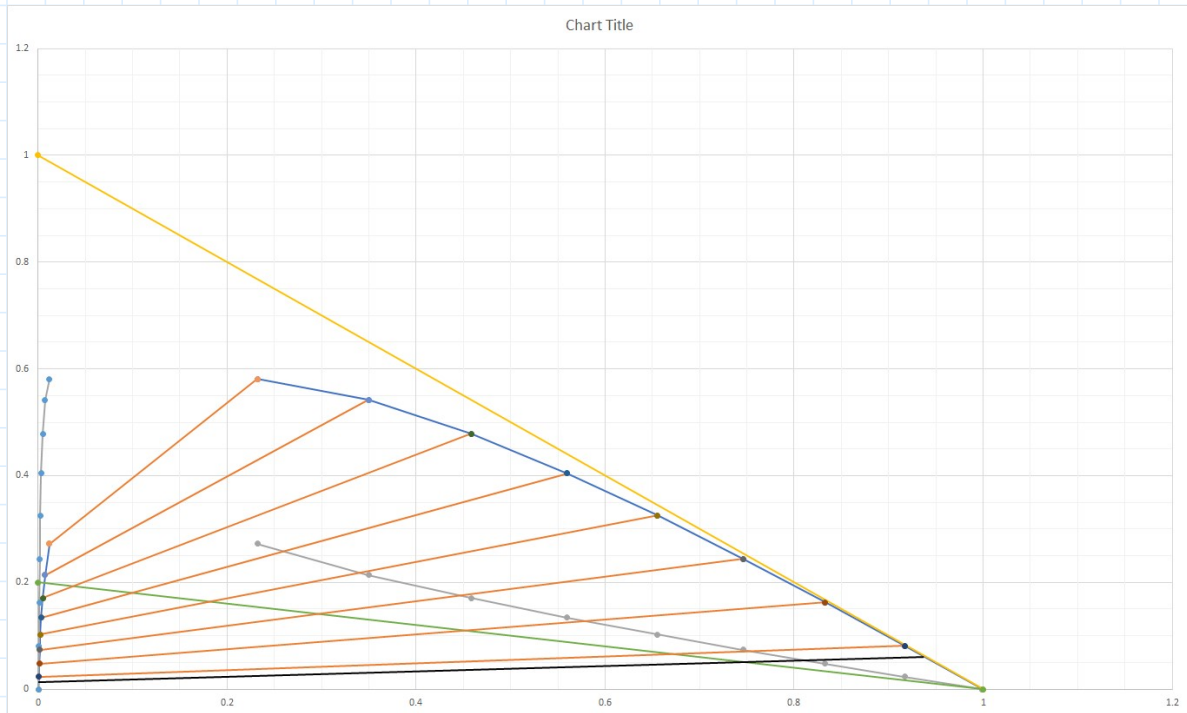
$$L := 10 \frac{kmol}{hr} \quad V := 90 \frac{kmol}{hr}$$

$$\frac{L}{V} = \frac{MV}{LM} \quad L + V = M$$

$$\begin{bmatrix} L \\ V \end{bmatrix} := \text{find}(L, V) = \begin{bmatrix} 157.576 \\ 242.424 \end{bmatrix} \frac{kmol}{hr}$$

$$S := F \cdot \left( \frac{y_{MS}}{1 - y_{MS}} \right) = 200 \frac{kmol}{hr}$$

Part b)



$$x_S := 0 \quad x_A := 0.019 \quad y_{MS} := 0.75 \quad y_S := 0.93 \quad y_A := 0.06$$

$$MV := y_S - y_{MS} = 0.18 \quad LM := y_{MS} - x_S = 0.75$$

$$x_C := 1 - x_S - x_A = 0.981 \quad y_C := 1 - y_S - y_A = 0.01$$

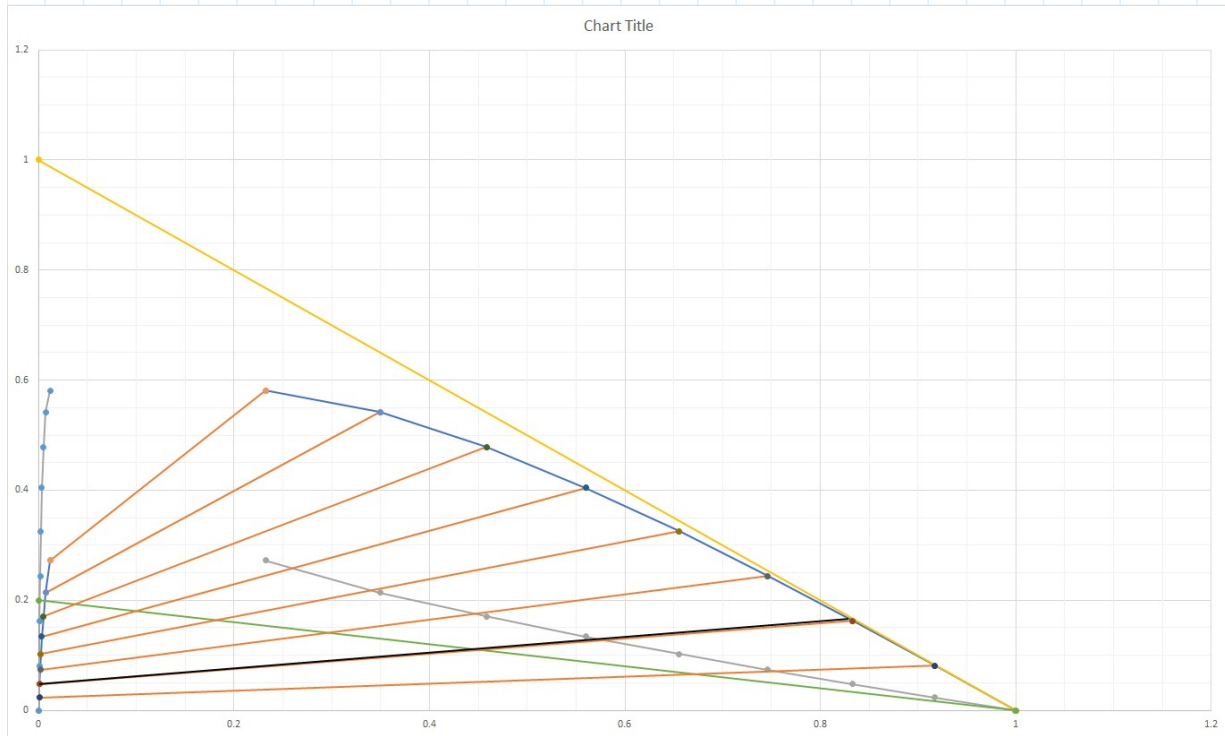
$$M := F + S = 400 \frac{\text{kmol}}{\text{hr}} \quad S := F \cdot \left( \frac{y_{MS}}{1 - y_{MS}} \right) = 600 \frac{\text{kmol}}{\text{hr}}$$

Solver Constraints

$$\begin{aligned} L &:= 1 \frac{\text{kmol}}{\text{hr}} & V &:= 1 \frac{\text{kmol}}{\text{hr}} \\ \frac{L}{V} &= \frac{MV}{LM} & L + V &= M \end{aligned}$$

$$\begin{bmatrix} L \\ V \end{bmatrix} := \text{find}(L, V) = \begin{bmatrix} 77.419 \\ 322.581 \end{bmatrix} \frac{\text{kmol}}{\text{hr}}$$

part c)



$$x_A := 5\% \quad y_{MS} := 0.43 \quad S := F \cdot \left( \frac{y_{MS}}{1 - y_{MS}} \right) = 150.877 \frac{\text{kmol}}{\text{hr}}$$

part d)

	Units	F	S	L	V	Z
Description						
From				B1	B1	B1
To		B1	B1			
Stream Class		CONVEN	CONVEN	CONVEN	CONVEN	CONVEN
Maximum Relative Error						
Cost Flow	\$/hr					
- MIXED Substream						
Phase		Liquid Phase	Liquid Phase	Liquid Phase		Liquid Phase
Temperature	C	25	25	25		25
Pressure	bar	1.01325	1.01325	1.01325	1.01325	1.01325
Molar Vapor Fraction		0	0	0		0
Molar Liquid Fraction		1	1	1		1
Molar Solid Fraction		0	0	0		0
Mass Vapor Fraction		0	0	0		0
Mass Liquid Fraction		1	1	1		1
Mass Solid Fraction		0	0	0		0
Molar Enthalpy	kcal/mol	-66.7894	-10.4713	-19.0843		-67.8272
Mass Enthalpy	kcal/kg	-2566.03	-79.6973	-161.46		-3362.57
Molar Entropy	cal/mol-K	-46.8272	-43.3533	-47.763		-40.856
Mass Entropy	cal/gm-K	-1.79909	-0.329964	-0.404091		-2.02546
Molar Density	mol/cc	0.0340839	0.0110927	0.0115447		0.0475513
Mass Density	kg/cum	887.144	1457.45	1364.57		959.17
Enthalpy Flow	Gcal/hr	-13.3579	-1.57907	-3.4932		-11.3787