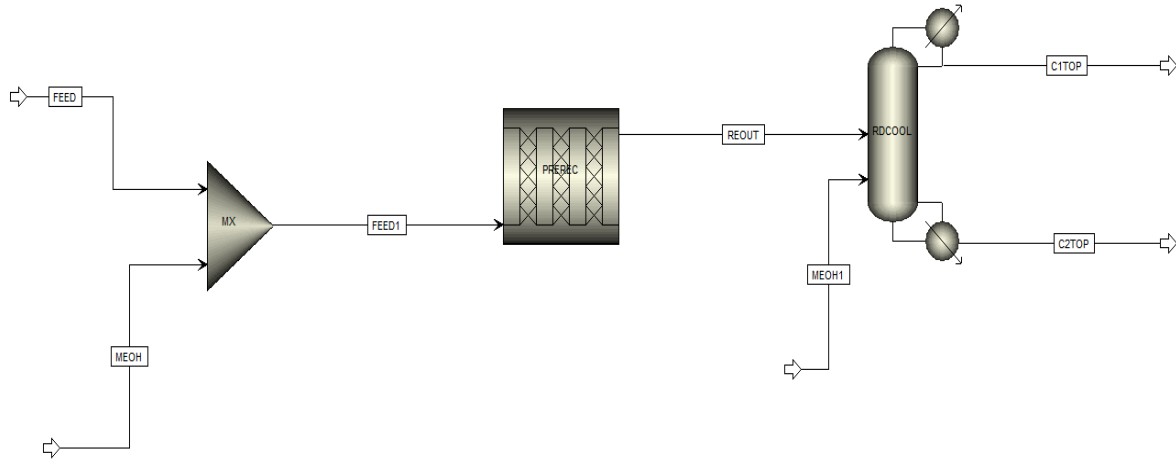


# ASSIGNMENT - 06

## ROLL NO – 234107206

### FLWSHEET :-



### STREAM RESULT :-

	Units	MEOH1	REOUT	C1TOP	C2TOP
Mass Solid Fraction		0	0	0	0
Molar Enthalpy	cal/mol	-56411.7	-37789.1	-41600.1	-74585.9
Mass Enthalpy	cal/gm	-1760.55	-585.964	-665.759	-730.017
Molar Entropy	cal/mol-K	-55.7204	-105.961	-103.815	-158.074
Mass Entropy	cal/gm-K	-1.73897	-1.64305	-1.66144	-1.54717
Molar Density	mol/cc	0.0221316	0.00933344	0.00905831	0.00609202
Mass Density	gm/cc	0.709143	0.601918	0.56601	0.622422
Enthalpy Flow	cal/sec	-3.68243e+06	-1.3332e+07	-1.2719e+07	-4.18982e+06
Average MW		32.0422	64.4905	62.4852	102.17
<b>— Mole Flows</b>	<b>kmol/hr</b>	<b>235</b>	<b>1270.08</b>	<b>1100.68</b>	<b>202.228</b>
2-MET-01	kmol/hr	0	85.5868	15.2119	0.00148957
2-MET-02	kmol/hr	0	164.992	33.1894	0.00707714
N-PEN-01	kmol/hr	0	789.5	789.47	0.0295886
METHA-01	kmol/hr	235	229.979	262.808	0.00218316
METHY-01	kmol/hr	0	0.0206742	0.0025744	202.188
<b>— Mole Fractions</b>					
2-MET-01		0	0.067387	0.0138204	7.36581e-06
2-MET-02		0	0.129907	0.0301535	3.49959e-05
N-PEN-01		0	0.621615	0.717256	0.000146313
METHA-01		1	0.181075	0.238768	1.07955e-05
METHY-01		0	1.62779e-05	2.33892e-06	0.999801
<b>+ Mass Flows</b>	<b>kg/hr</b>	<b>7529.91</b>	<b>81908</b>	<b>68776.3</b>	<b>20661.6</b>

## REFLUX RATIO :-

Configuration Streams Pressure Condenser Reboiler 3-Phase Comments

Setup options

Calculation type: Equilibrium

Number of stages: 35 Stage Wizard

Condenser: Total

Reboiler: Kettle

Valid phases: Vapor-Liquid

Convergence: Standard

Operating specifications

Reflux ratio: Mole 4

Reboiler duty: 38.2 MW

Free water reflux ratio: 0 Feed Basis

- Reflux Ratio of Red-Frac column for above mentioned purity of TAME is 4
- Total number of stages in Red-Frac column is 35

## NUMBER OF STAGES :-

Configuration Streams Pressure Condenser Reboiler 3-Phase Comments

Feed streams

Name	Stage	Convention
REOUT	28	On-Stage
MEOH1	23	On-Stage

Product streams

Name	Stage	Phase	Basis	Flow	Units	Flow Ratio	Feed Specs
C2TOP	35	Liquid	Mole		kmol/hr		Feed basis
C1TOP	1	Liquid	Mole		kmol/hr		Feed basis

Pseudo streams

Name	Pseudo Stream Type	Stage	Internal Phase	Reboiler Phase	Reboiler Conditions	Pumparound ID	Pumparound Conditions	Flow	Units
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- Feed enter stage for both outlet stream from reactor as well as methanol stream at 28 and 23 on stage respectively

## COLUMN INTERNAL SPECIFICATION :-

Status: Active


Column description:  Input Complete

Name	Start Stage	End Stage	Mode	Internal Type	Tray/Packing Type	Tray Details	Packing Details			Tray Spacing/Section Packed Height		Diameter		Details
						Number of Passes	Vendor	Material	Dimension					
CS-1	2	34	Rating	Packed	PALL		GENERIC	METAL	1.5-IN OR 38-	20 meter		5.5 meter	<input type="button" value="View"/>	

☒ Don't update pressure drop  
☐ Update pressure drop from top stage  
☐ Update pressure drop from bottom stage  
☐ Include static vapor head in pressure drop calculations  
☐ Calculate pressure drop across sump

Sump

Diameter:  meter  
☒ Liquid residence time:  hr  
☐ Liquid level:  meter



## COLUMN INTERNAL SUMMARY :-

Column Internals Summary

Summary

		Value	Units
▶	Number of Trayed/Packed stages	33	
▶	Total height	20	meter
▶	Total head loss (Hot liquid height)	0.554955	meter
▶	Total pressure drop	0.0332023	bar
▶	Number of sections	1	
▶	Number of diameters	1	
▶	Pressure drop across sump		bar

Sections

		Start Stage	End Stage	Diameter	Section Height	Internals Type	Tray Type or Packing Type	Section Pressure Drop		% Approach to Flood	Limiting Stage	
▶	CS-1	2	34	5.5 meter	20 meter	PACKING	PALL	0.0332023	bar	80.1322	34	<div>View</div>

- Number of packed stages is 33
- Height = 20 meter & Diameter = 5.5 meter