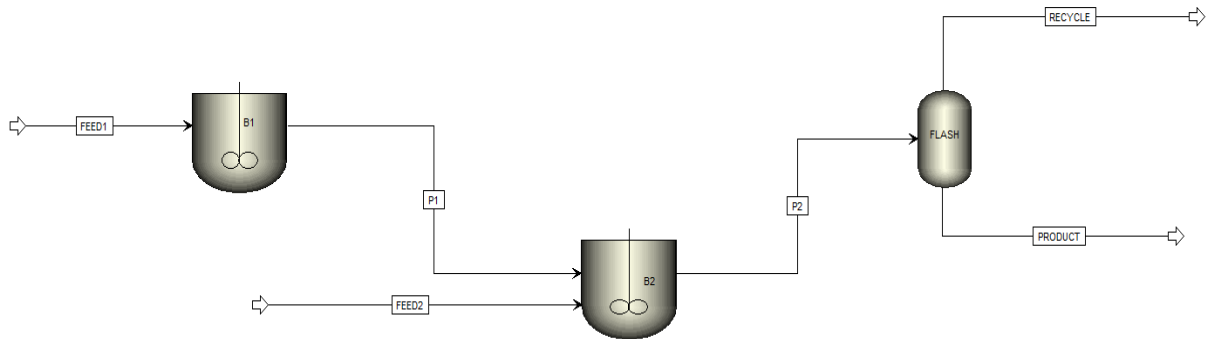


# ASSIGNMENT – 7

## ROLL NO – 234107206

1.

Flowsheet :-

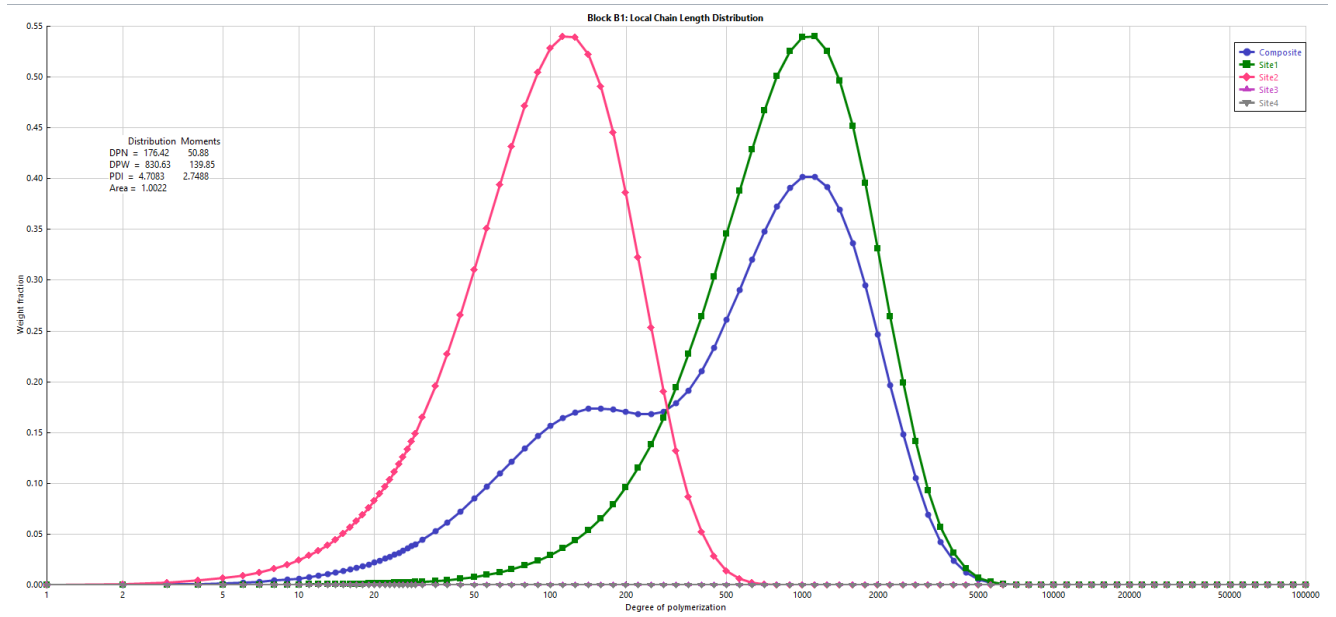


Stream Result :-

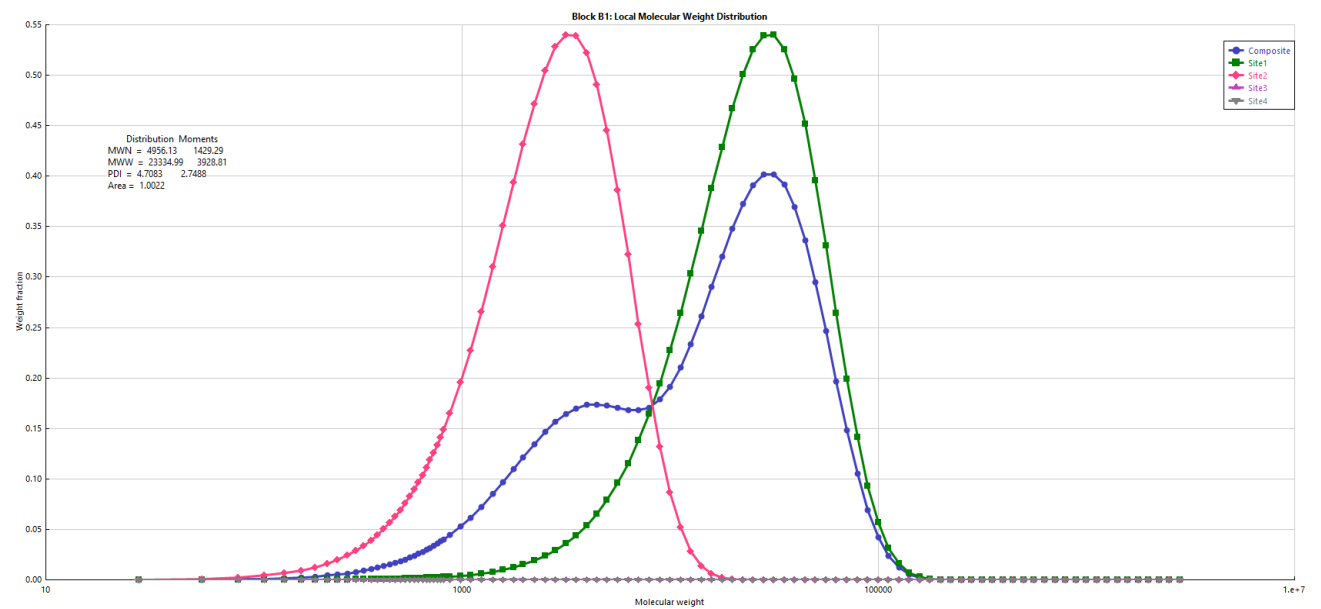
	Units	FEED1	FEED2	P1	P2	PRODUCT	RECYCLE
Phase				Liquid Phase	Liquid Phase	Liquid Phase	Vapor Phase
Temperature	C	60	60	200	200	250	250
Pressure	bar	200	200	200	200	20	20
Molar Vapor Fraction		0.0403663	0.306104	0	0	0	1
Molar Liquid Fraction		0.959634	0.693896	1	1	1	0
Molar Solid Fraction		0	0	0	0	0	0
Mass Vapor Fraction		0.0068664	0.0580838	0	0	0	1
Mass Liquid Fraction		0.993134	0.941916	1	1	1	0
Mass Solid Fraction		0	0	0	0	0	0
Molar Enthalpy	kcal/mol	-20.3296	-15.7868	-16.7132	-16.8093	-13.7303	-9.86932
Mass Enthalpy	cal/gm	-342.572	-334.855	-281.634	-293.722	-335.112	-172.441
Molar Entropy	cal/mol-K	-91.5397	-73.6943	-83.1678	-81.9056	-59.172	-64.018
Mass Entropy	cal/gm-K	-1.54253	-1.56313	-1.40146	-1.4312	-1.4442	-1.11855
Molar Density	mol/cc	0.00885768	0.00800342	0.00379901	0.0038784	0.00928468	0.000502802
Mass Density	gm/cc	0.525649	0.377323	0.225448	0.221955	0.380414	0.028777
Enthalpy Flow	kcal/hr	-3.08315e+07	-5.02283e+06	-2.5347e+07	-3.08408e+07	-7122.74	-1.81026e+07
Average MW		59.3439	47.1452	59.3439	57.2286	40.9722	57.2332
✚ Mole Flows	kmol/hr	1516.58	318.166	1516.58	1834.75	0.518761	1834.23
✚ Mole Fractions							
✚ Mass Flows	kg/hr	90000	15000	90000	105000	21.2548	104979
C2H4	kg/hr	18000	3000	17996.6	20988.9	0.247766	20988.6
HDPE	kg/hr	0	0	3.44585	11.1362	11.1362	2.84076e-80
H2	kg/hr	90	150	89.9988	239.993	3.45827e-07	239.993
TiCl4	kg/hr	450	75	450	525	0.136824	524.863
TEA	kg/hr	450	75	449.996	524.99	0.247531	524.742
N-HEX-01	kg/hr	71010	11700	71010	82710	9.48648	82700.5
✚ Mass Fractions							
Volume Flow	l/min	2853.62	662.562	6653.43	7884.47	0.931214	60800.2

For CSTR 1 :-

## Degree of Polymerization

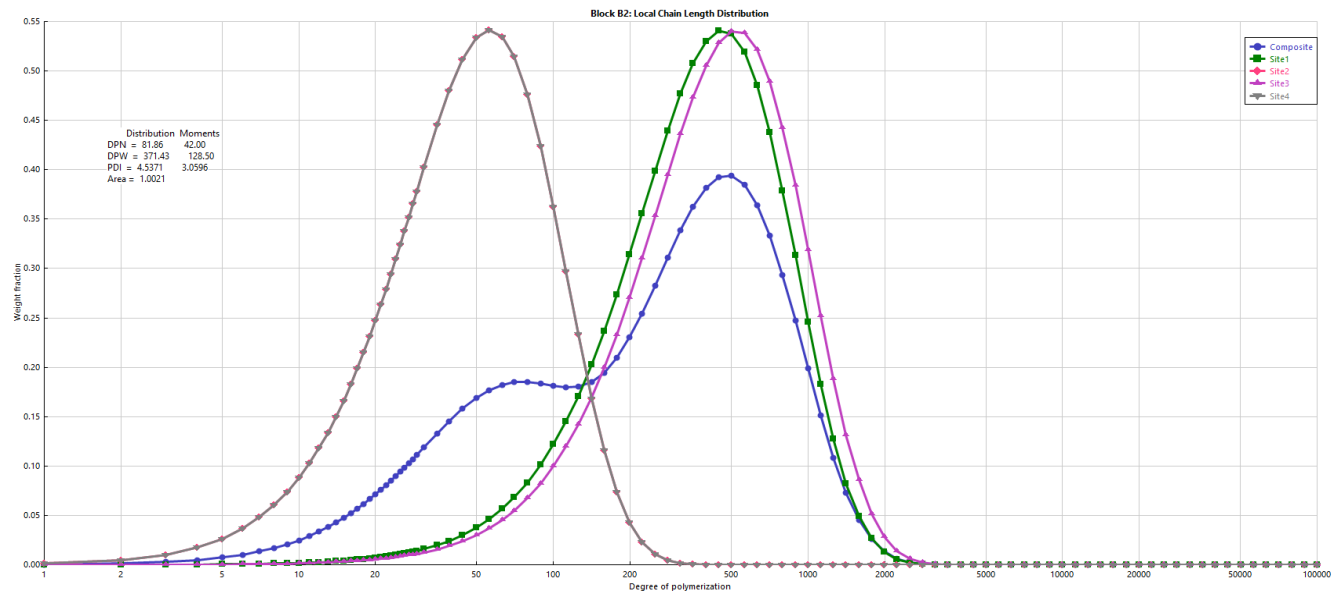


## Molecular Weight Distribution

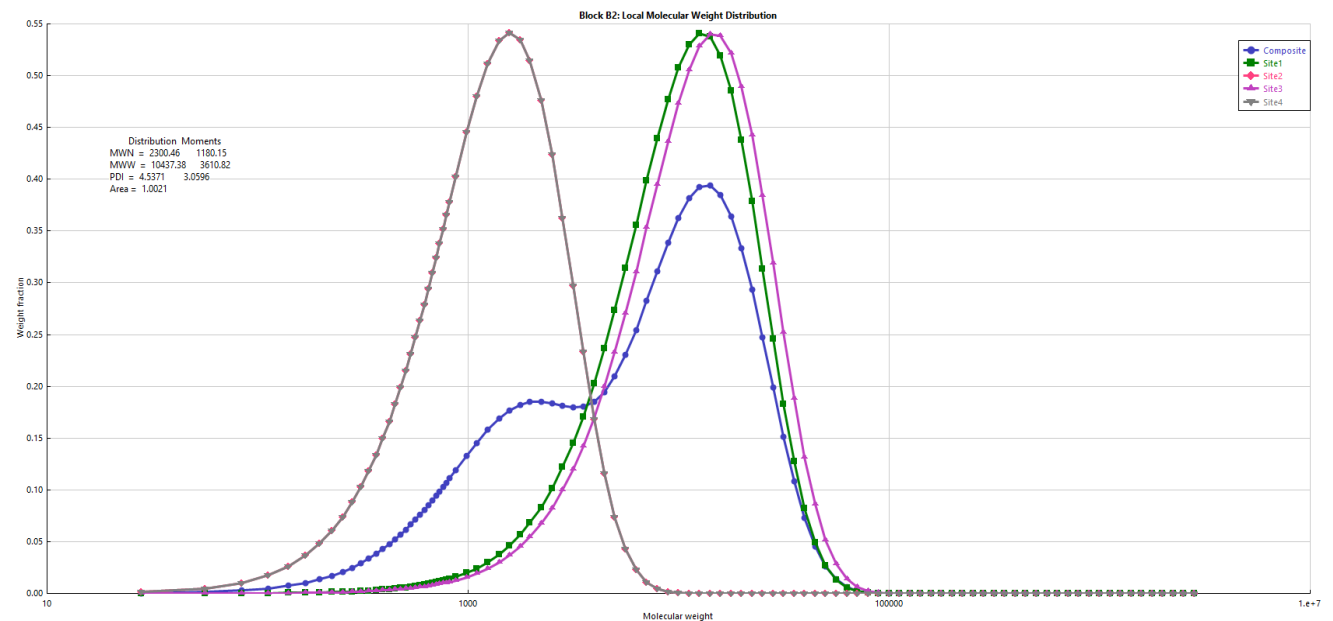


For CSTR 2 :-

## Degree of Polymerization

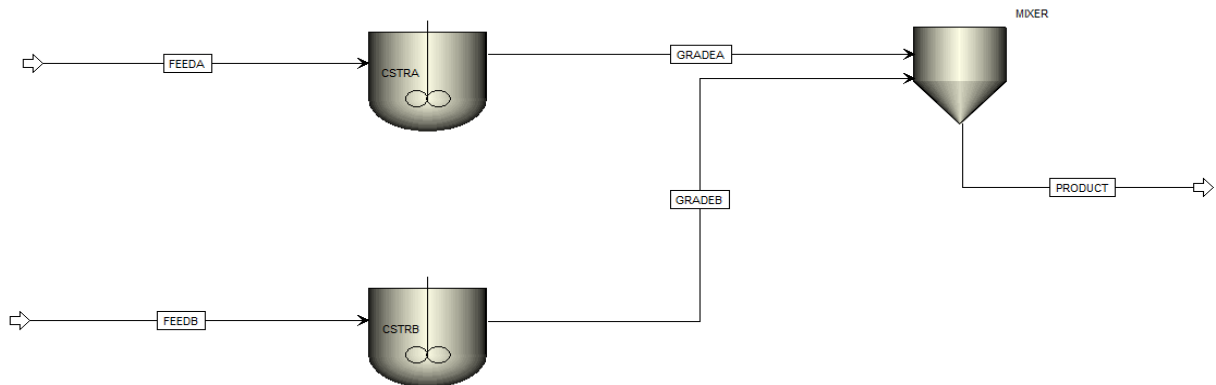


## Molecular Weight Distribution



2.

Flowsheet :-



Feed A :-

Flash Type		Temperature	Pressure
State variables			
Temperature	70	C	
Pressure	2	atm	
Vapor fraction			
Total flow basis	Mass		
Total flow rate	24000	kg/hr	
Solvent			
Reference Temperature			
Volume flow reference temperature			
	C		
Component concentration reference temperature			
	C		

Composition	
Mass-Frac	
Component	Value
AN	0.23
STYRENE	0.23
SAN	
AIBN	0.004
XYLENE	0.496
EB	0.04
Total	1

Feed B :-

Flash Type		Temperature	Pressure
State variables			
Temperature	70	C	
Pressure	2	atm	
Vapor fraction			
Total flow basis	Mass		
Total flow rate	24000	kg/hr	
Solvent			
Reference Temperature			
Volume flow reference temperature			
	C		
Component concentration reference temperature			
	C		

Composition	
Mass-Frac	
Component	Value
AN	0.25
STYRENE	0.25
SAN	
AIBN	0.004
XYLENE	0.496
EB	
Total	1

## CSTR A Specification :-

Operating conditions	
Pressure	<input type="text" value="2"/> atm
<input checked="" type="radio"/> Temperature	<input type="text" value="70"/> C
<input type="radio"/> Duty	<input type="text"/> kcal/hr
<input type="radio"/> Vapor fraction	<input type="text"/>

Holdup	
Valid phases	<input type="text" value="Liquid-Only"/> <input type="button" value="2nd Liquid"/>
Specification type	<input type="text" value="Reactor volume"/>
Reactor	
Volume	<input type="text" value="10"/> cum
Resi. time	<input type="text"/> hr
Phase	
Phase	<input type="text"/>
Volume	<input type="text"/> l
Volume frac	<input type="text"/>
Residence time	<input type="text"/> hr

## CSTR B Specification :-

Operating conditions	
Pressure	<input type="text" value="2"/> atm
<input checked="" type="radio"/> Temperature	<input type="text" value="70"/> C
<input type="radio"/> Duty	<input type="text"/> kcal/hr
<input type="radio"/> Vapor fraction	<input type="text"/>

Holdup	
Valid phases	<input type="text" value="Liquid-Only"/> <input type="button" value="2nd Liquid"/>
Specification type	<input type="text" value="Reactor volume"/>
Reactor	
Volume	<input type="text" value="10"/> cum
Resi. time	<input type="text"/> hr
Phase	
Phase	<input type="text"/>
Volume	<input type="text"/> l
Volume frac	<input type="text"/>
Residence time	<input type="text"/> hr

## Reaction 1 :-

	Reaction	Reactants		Products	Active	Delete
▶	1) Init-Dec	Aibn	->	e.n.R* + a.A + b.B	<input checked="" type="checkbox"/>	✗
▶	2) Chain-Ini	Styrene + R*	->	P1[Styrene]	<input checked="" type="checkbox"/>	✗
▶	3) Chain-Ini	An + R*	->	P1[An]	<input checked="" type="checkbox"/>	✗
▶	4) Propagation	Pn[Styrene] + Styrene	->	Pn+1[Styrene]	<input checked="" type="checkbox"/>	✗
▶	5) Propagation	Pn[Styrene] + An	->	Pn+1[An]	<input checked="" type="checkbox"/>	✗
▶	6) Propagation	Pn[An] + Styrene	->	Pn+1[Styrene]	<input checked="" type="checkbox"/>	✗
▶	7) Propagation	Pn[An] + An	->	Pn+1[An]	<input checked="" type="checkbox"/>	✗
▶	8) Chat-Mon	Pn[Styrene] + Styrene	->	(1-f).Dn + f.Dn= + P1[Styrene]	<input checked="" type="checkbox"/>	✗
▶	9) Chat-Mon	Pn[Styrene] + An	->	(1-f).Dn + f.Dn= + P1[An]	<input checked="" type="checkbox"/>	✗
▶	10) Chat-Mon	Pn[An] + Styrene	->	(1-f).Dn + f.Dn= + P1[Styrene]	<input checked="" type="checkbox"/>	✗
▶	11) Chat-Mon	Pn[An] + An	->	(1-f).Dn + f.Dn= + P1[An]	<input checked="" type="checkbox"/>	✗

## Reaction 2 :-

	Reaction	Reactants		Products	Active	Delete
▶	1) Init-Dec	Aibn	->	e.n.R* + a.A + b.B	<input checked="" type="checkbox"/>	✗
▶	2) Chain-Ini	An + R*	->	P1[An]	<input checked="" type="checkbox"/>	✗
▶	3) Chain-Ini	Styrene + R*	->	P1[Styrene]	<input checked="" type="checkbox"/>	✗
▶	4) Propagation	Pn[An] + An	->	Pn+1[An]	<input checked="" type="checkbox"/>	✗
▶	5) Propagation	Pn[An] + Styrene	->	Pn+1[Styrene]	<input checked="" type="checkbox"/>	✗
▶	6) Propagation	Pn[Styrene] + An	->	Pn+1[An]	<input checked="" type="checkbox"/>	✗
▶	7) Propagation	Pn[Styrene] + Styrene	->	Pn+1[Styrene]	<input checked="" type="checkbox"/>	✗
▶	8) Chat-Mon	Pn[An] + An	->	(1-f).Dn + f.Dn= + P1[An]	<input checked="" type="checkbox"/>	✗
▶	9) Chat-Mon	Pn[An] + Styrene	->	(1-f).Dn + f.Dn= + P1[Styrene]	<input checked="" type="checkbox"/>	✗
▶	10) Chat-Mon	Pn[Styrene] + An	->	(1-f).Dn + f.Dn= + P1[An]	<input checked="" type="checkbox"/>	✗
▶	11) Chat-Mon	Pn[Styrene] + Styrene	->	(1-f).Dn + f.Dn= + P1[Styrene]	<input checked="" type="checkbox"/>	✗

