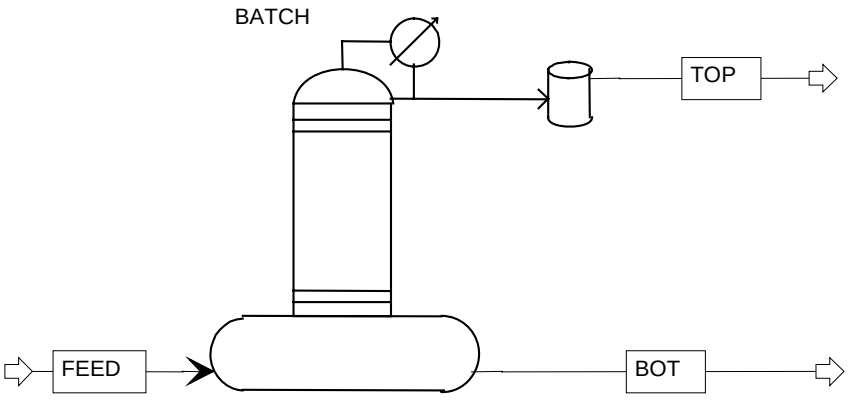
Design of Integrated Batch Distillation Set-up For the following solvent Recovery systems

1. 75% DMSO + 25% Water
2. 80% Toluene + 20% Ethyl Acetate
3. 40% Methanol + 60% Water
4. 88% IPA + 10% DCM + 2% high Boiling impurities
5. 93% IPA + 4% Ethyl Acetate + 3% Solid residue

The design was in line with the technical discussion between our engineers

1. Batch Distillation Column of 1 KL of initial charge is designed (As against the design of the continuous column proposed).
2. The 40% Methanol-60% Water system is included as one of the solvent mixtures for separation.
3. The system of 80% Toluene – 20% Ethyl Acetate is designed to achieve EA purity of 80% w/w.
4. The total system is designed for the distillate rate of 75 liter/hr (approx 80 kg/hr) except for the case of 4%EA-93%IPA-3%High Boiler system.

Complete flow sheet of the process simulated

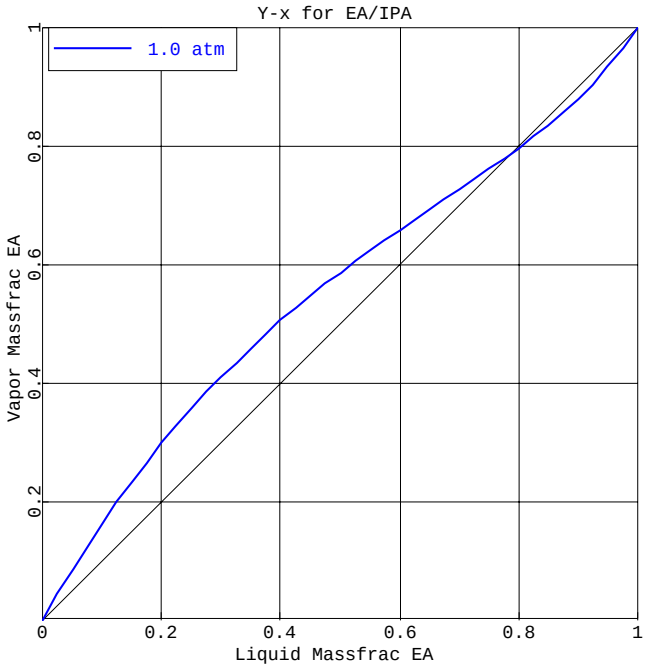


Separation of 4% EA – 93% IPA – 3% High Boiler

1. Batch Size : 1 KL
2. Feed composition

	FEED-4B
Temperature C	30
Pressure bar	1.01
Mass Flow kg	786.61
Volume Flow cum	1
Mass Flow kg	
EA	31.46
IPA	731.55
HIGH BOILER	23.60
Mass Frac	
EA	0.04
IPA	0.93
HIGH BOILER	0.03

Reported YX Plot for EA-IPA system



Operating Steps

a. Charge/Total Reflux time : 1 hr

b. I Cut – EA-IPA Azeotrope Removal

- Operating Pressure --- mmHg
- Top Temperature 73.5^{o} C
- Bottom Temperature 82.5^{o} C

- Distillate rate --- Kg/hr
- Mass Reflux Ratio ---
- Operating Time --- hr
- Total Distillate collected 58.75 Kg

Distillate Composition
i. EA : 0.535
ii. IPA : 0.465

c. II Cut – Product IPA Separation

- Operating Pressure --- mmHg
- Top Temperature 82.3^{o} C
- Distillate rate 80 Kg/hr
- Mass Reflux Ratio 10
- Operating Time --- hr
- Total Distillate collected --- Kg

Distillate composition
i. IPA : 0.999
ii. High Boiler : TRACE

Total Batch time : --- hours

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