

# Separation of Separation of Pyridine and Toluene with the help of 1 - Propanol

OM PANDEY

Sardar Vallabhbhai National Institute of Technology, Surat

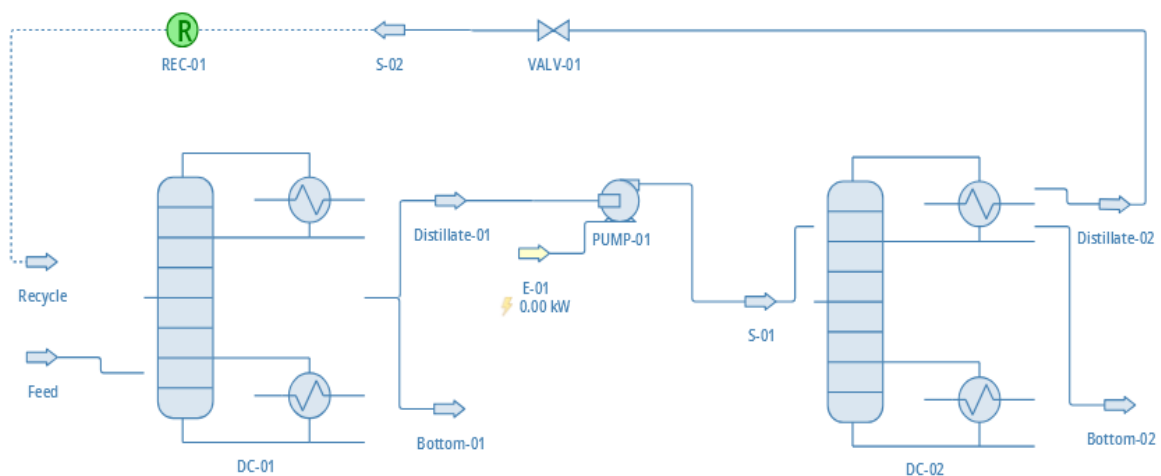
## Background & Description:

A quite small amount of pyridine was aimed to be separated from toluene by continuous distillation to get a high-purity toluene as a product. Based on the properties of the mutual solubility between pyridine and propanol, and azeotropy between toluene and propanol, propanol was selected as the solvent.

Looking at the partial-soluble property of the system, the **NRTL** thermodynamic method was used to investigate the effect of the ratio of extraction mass flow to material mass flow, the ratio of condensation rate to material mass flow, and the feed stage of the purification and the material on the separation effect to get the best operating parameters.

In this extraction process, DC-01 column is followed by another column DC-02. Distillate of DC-01 is at nearly azeotropic composition which is then pumped to DC-02. The bottom product from each column is at the desired purity level.

## Flowsheet:



## Results:

Master Property Table									
Object	S-02	S-01	Recycle	Feed	Distillate-02	Distillate-01	Bottom-02	Bottom-01	
Temperature	170.141	93.3157	170.141	50	170.141	93.3157	132.357	110.236	C
Pressure	9.11925	1.01325	9.11925	1.01325	9.11925	1.01325	3.2424	1.01325	bar
Mass Flow	1.55015E-12	1.59279E-12	1.55015E-12	9148.65	1.55015E-12	1.59279E-12	4.26366E-14	3.95627E-15	kg/h
Mass Fraction (Overall Liquid)	0.64974	0.999999	0.64974	1	1	0.999999	1	1	
Mass Fraction (Mixture) / Toluene	0.328755	0.319996	0.328755	0.95677	0.328755	0.319996	0.0015324	0.999348	
Mass Fraction (Mixture) / 1-propanol	0.671245	0.680004	0.671245	0	0.671245	0.680004	0.998468	0.000652452	

## Conclusion:

Required high-purity Toluene is obtained with the given flowsheet with a purity of 99.9348%.

## Reference:

<https://doi.org/10.1016/j.dib.2020.105937>