

# Distillation for Separating Acetone and N-Heptane Binary Azeotropic Mixture

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## Background & Description:

When the mixture of two compounds has very close normal boiling points, their relative volatility is likely to be small if they do not form an azeotrope. In such cases, the extractive distillation process with a high boiling solvent is commonly utilized to separate the azeotropes. In extractive distillation, a less volatile solvent is used to increase the relative volatilities of the original mixtures, allowing for easier separation. In the flowsheet separation of N-heptane and Acetone is done using Benzene as a solvent.

In this flowsheet there are two distillation column ( DC-01 , DC-02). In first column , Acetone is the major top product in stream (S-03) with mole fraction of 0.991188 and the bottom products are benzene (0.079936) and N-Heptane (0.920056). For further separation , second distillation column gives major bottom product as N-Heptane (0.999674), the top product with benzene is recycled (REC-01) and is mixed with makeup stream (S-08).

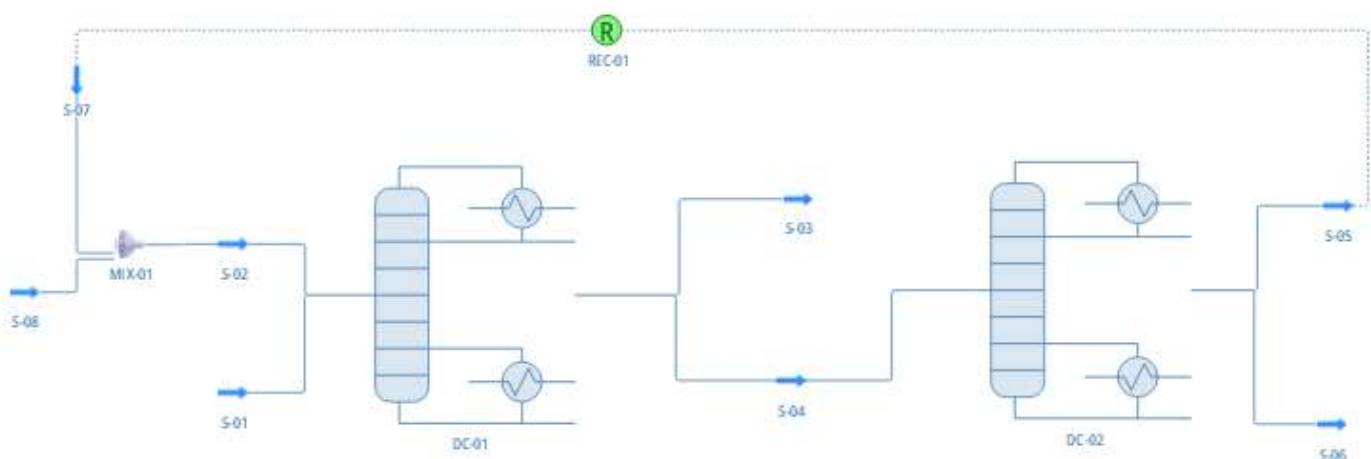
## System of Units:

Temperature: °C,  
Pressure: bar,  
Molar flow: kmol/h,  
Mass flow: kg/h

## Property Package:

UNIFAC – LL

## Flowsheet:



## Results:

Master Property Table									
Object	S-08	S-07	S-06	S-05	S-04	S-03	S-02	S-01	
Temperature	45	92.3807	98.3757	92.3807	96.5402	56.2171	92.2547	25	C
Pressure	1.01325	1.01325	1.01325	1.01325	1.01325	1.01325	1.01325	1.01325	bar
Molar Fraction (Mixture) / Acetone	0	1.36329E-05	2.62069E-17	1.36329E-05	6.8164E-06	0.991188	1.35279E-05	0.5	
Molar Fraction (Mixture) / N-heptane	0	0.840439	0.999674	0.840439	0.920057	0.00552969	0.837012	0.5	
Molar Fraction (Mixture) / Benzene	1	0.159548	0.000325649	0.159548	0.0799366	0.00328198	0.162975	0	