

## Pressure Swing Distillation Of Ethyl Acetate And N-Hexane

### Background:

Pressure swing distillation is a method used to separate azeotropic mixture in more than one distillation column which is operated under different pressure. Binary azeotropic mixture loses their azeotropic behavior by varying pressure of the column.

Ethyl acetate and N-hexane both are important organic solvents widely used in textile and chemical industries due to having high solubility. Here ethyl acetate and N-hexane are separated using pressure swing distillation by NRTL thermodynamic model.

### Description of flowsheet:

A mixture of N-hexane and Ethyl acetate and having mass fraction 0.61 and 0.39 respectively fed to the low pressure distillation column (LPC) which is operate at 100000 Pa Pressure. Feed is fed to the 8th stage of 26 staged low pressure distillation column. At the bottom of LPC 0.97 mole fraction of ethyl acetate were obtained. Top product feed to the 7th stage of 25 staged high pressure column (HPC), which is operate at 600000 Pa Pressure. Here bottom product N-hexane having mole fraction of 0.999 were obtained. Top product is get recycle back and feed to the LPC at 16th stage.

Stream	Bottom s1	Bottom 2	Distillate 1	Distillate 2	Feed	Recycle	Units
Temperature	347.67	411.557	344.991	413.772	298.15	345.32519	K
Pressure	100000	600000	100000	600000	101325	100000	Pa
Molar Flow	0.3342	0.8108	33.1398	32.329	3.195817	55.438505	mol/s
Molar Fraction(Mixtur e)/ N-hexane	0.03	0.999	0.568335	0.562457	0.61	0.5624954 3	
Molar Fraction(Mixtur e)/ Ethyl Acetate	0.97	0.001	0.431465	0.437543	0.39	0.4375045 7	

**References:**

Comparison of continuous homogenous azeotropic and pressure-swing distillation for a minimum azeotropic system ethyl acetate/N-hexane separation by Liping Lv, Lin Zhu, Huimin Liu, Hang Li, Shirui Sun