

Separation of Ethyl Acetate-Ethanol Azeotrope

Neel Pulin Modi

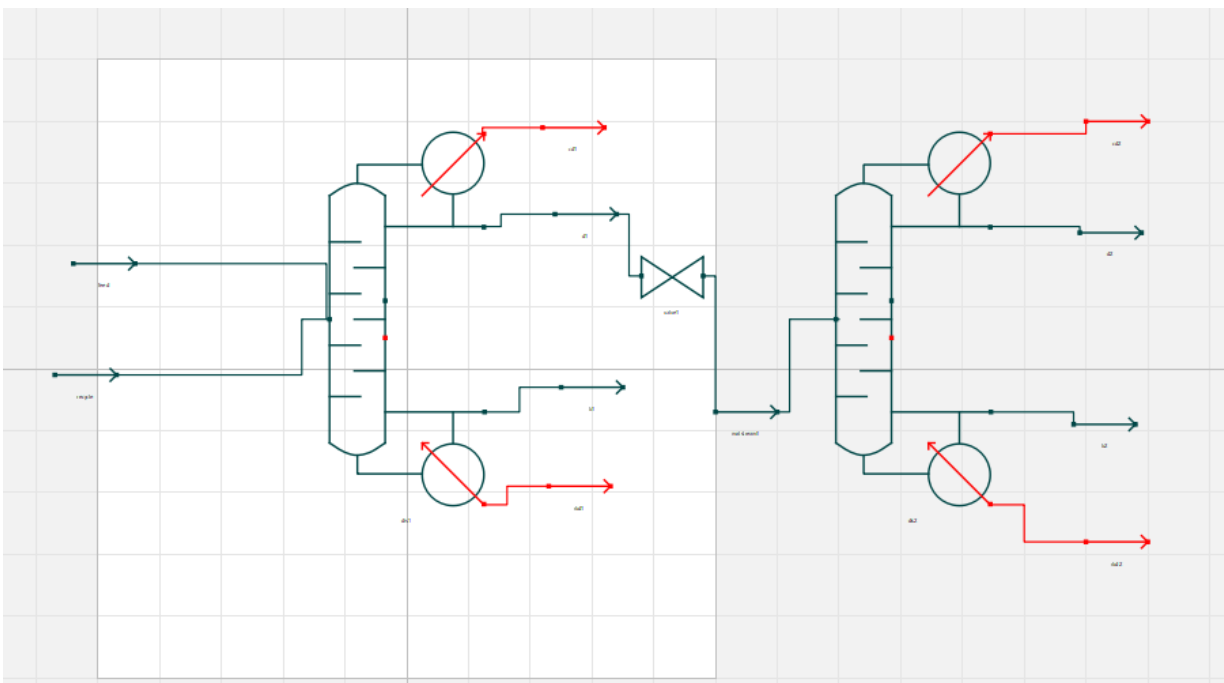
Indian Institute of
Technology, Madras

Background & Description:

Ethyl acetate (EA) and ethanol (ETOH) are both essential raw materials and solvents widely used in the chemical industry due to their excellent solubility. However, it remains a significant challenge to effectively separate their mixtures since the presence of minimum boiling azeotrope at composition and temperature of 55.55 mol percent EA and 344.96 K at the atmospheric pressure (101325 xPa) respectively. Pressure swing distillation is a commonly used process to separate azeotropic mixtures whose compositions are pressure sensitive.

The feed (50 % mol fraction EA) and recycle enters the HPC. The bottoms product obtained is 99.996% mol fraction ethyl acetate. The distillate is then fed into LPC and the bottom product obtained is 99.996 % mol fraction EA. The distillate obtained is then recycled back with the feed in HPC.

Flowsheet:



Results:

	Temperature (K)	Pressure (Pa)	Mole flow (mol/s)	Mole fraction (ethanol)
feed	320	607950	100	0.5
recycle	326	607950	95.99	0.521
b1	416.824	607950	50	0.004
d2	327.32	101325	95.99	0.521
b2	326	101325	50	0.996