

Pressure swing of Tetrahydrofuran and water

AVSS.Praneeth

National institute of technology, Warangal

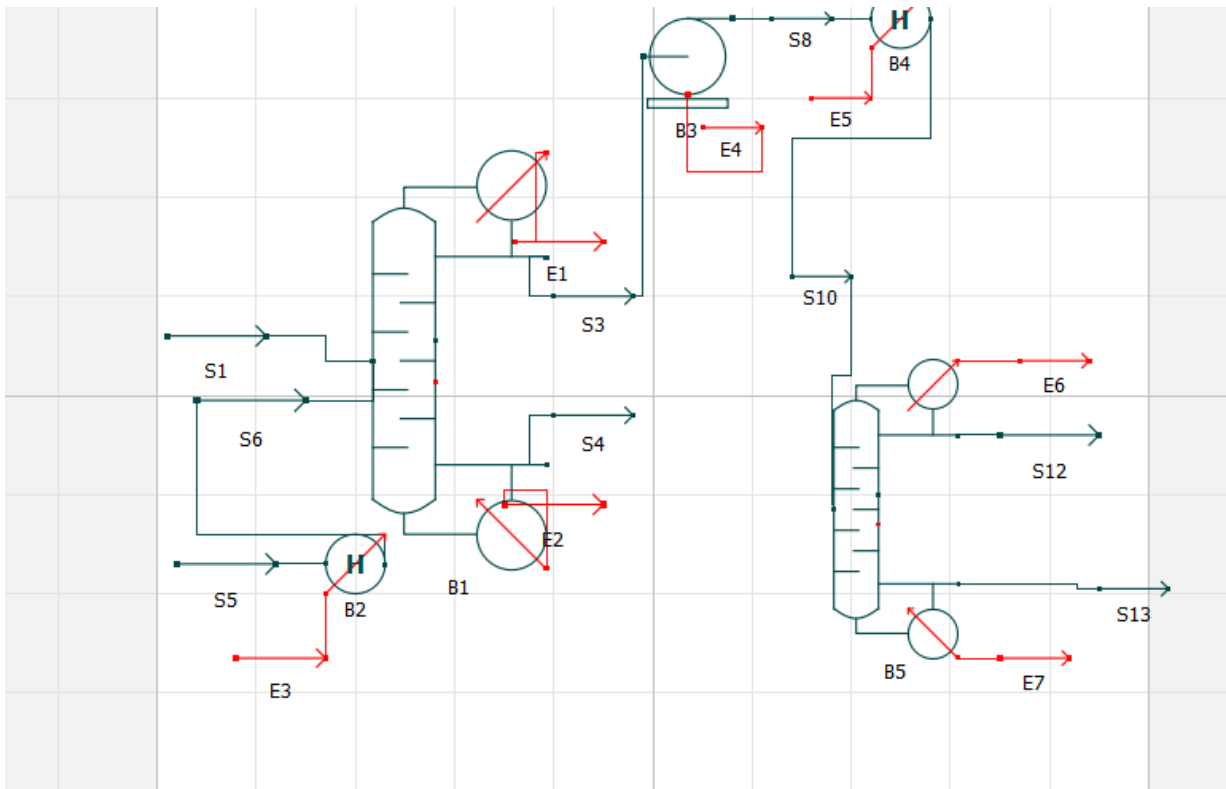
Background & Description:

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. THF and water both are separated using pressure swing distillation.

Process

A mixture of THF and water having mass fraction 0.06 and 0.94 respectively fed to the low-pressure distillation column (LPC) 1.1 bar which is operate at Pressure. Feed is fed to the 13th stage of 17 staged low-pressure distillation column. At the bottom of LPC 0.99 water were obtained. Top product feed to the 6th stage of 17 staged high-pressure column (HPC), which is operate at 7.9 bar Pressure. Here bottom product THF as major product is obtained.

Flowsheet:



Results:

	S1	S5	S6	S3	S4	S8	S10	S12	S13
Pressure	110000	110000	110000	110000	110000	790000	790000	790000	790000
Temperature	61.5364	35	73.375	62.0124	102.04	62.117	88.653	133.98	146.94
Molar flowrate	76.5268	555.555	555.555	109.789	522.293	109.789	109.789	76.3395	33.4497
X_{THF}	0.613	0.06	0.06	.690366	0.009	.690366	.690366	0.873551	0.0272298
$X_{\text{h}_2\text{o}}$	0.3869	0.94	0.94	.0309634	0.990996	.0309634	.0309634	0.126449	0.727702