

Pressure-swing distillation for separating binary minimum azeotropic mixture dimethyl carbonate and ethanol

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Background & Description:

An energy-efficient extractive pressure-swing distillation process is proposed for separating binary minimum azeotropic mixture ethanol and dimethyl carbonate. . In this flowsheet separation of dimethyl carbonate and ethanol. We cannot separate dimethyl carbonate and ethanol directly so we have to use another entrainer compound to separate dimethyl carbonate and ethanol. By using distillation column of 65 trays. After that for increase yield we are using recycle process.

In this flowsheet there are two type of distillation column DC-1 and DC-2. In the 1st column ethanol is major top product in stream (0.99) S-03, and minor bottom product are dimethyl carbonate in stream (0.2)S-04. In the 2nd column dimethyl is major top product in stream (0.985) s-05

System of Units:

Custom unit: C5

Temperature: degree Celsius

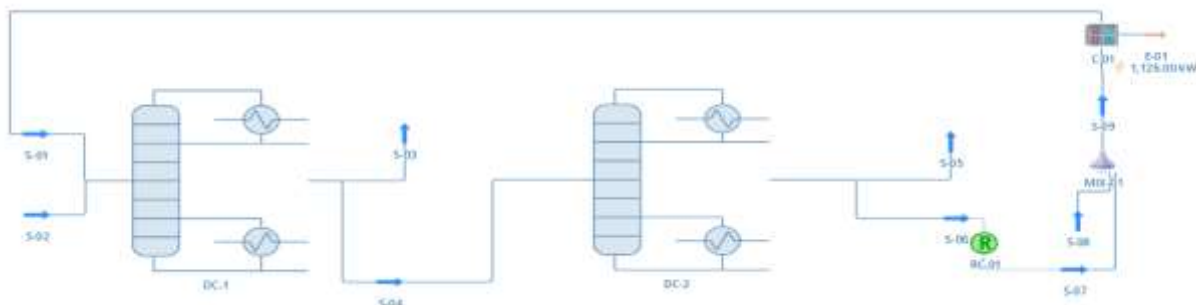
Molar flow: kmol/h

Mass flow: kg/h

Property package

Raoult's law

Flowsheet:



Results:

Master Property Table										
Object	S-09	S-08	S-07	S-06	S-05	S-04	S-03	S-02	S-01	
Temperature	137.431	25	137.926	137.926	89.9388	120.878	78.6637	300	41.6484	C
Pressure	1	1	1.01325	1.01325	1.01325	1.01325	1.01325	1.01325	1	bar
Molar Flow	200.442	0.0578	200.442	200.442	50.7134	251.156	49.2865	100	200.442	kmol/h
Mass Fraction (Mixture) / Ethanol	1.70168E-11	0	1.73521E-11	1.73521E-11	0.00774895	0.00136119	0.998047	0.338374	1.70168E-11	
Molar Fraction (Mixture) / Dimethyl carbonate	9.99711E-05	0	0.0001	0.0001	0.98496	0.198963	0.001	0.5	9.99711E-05	