

Methyl Methacrylate Separation Process

Abstract:

Azeotropes are close boiling mixtures which are difficult to separate through simple distillation. To separate azeotropic mixtures another light component is added to mixture through which a binary minimum boiling azeotrope can be formed. Bottom is generally obtained as high purity product and top product is near to heterogeneous azeotrope. This top product can be sent to decanter for separation in aqueous and organic streams. Organic phase is sent to back to column whereas aqueous stream is processed as per requirement

Description:

Wu et al [1] devised a two-column design with a bottom decanter. The reproduced flowsheet is shown in Figure 1. The bottom composition of the distillation column was designed to be near MMA/H₂O azeotrope so that a decanter can be designed to obtain aqueous and organic streams. The system is shown which contains two column and one recycle stream.

The top product from column-I is 95.3% Methanol and bottom product is mixed with recycle from column-II and sent to decanter at 323.15 K. The bottom product from decanter is 99% water and top product is again sent to column for further separation. The bottom product of column-II is 99% MMA and top product is recycled and back.

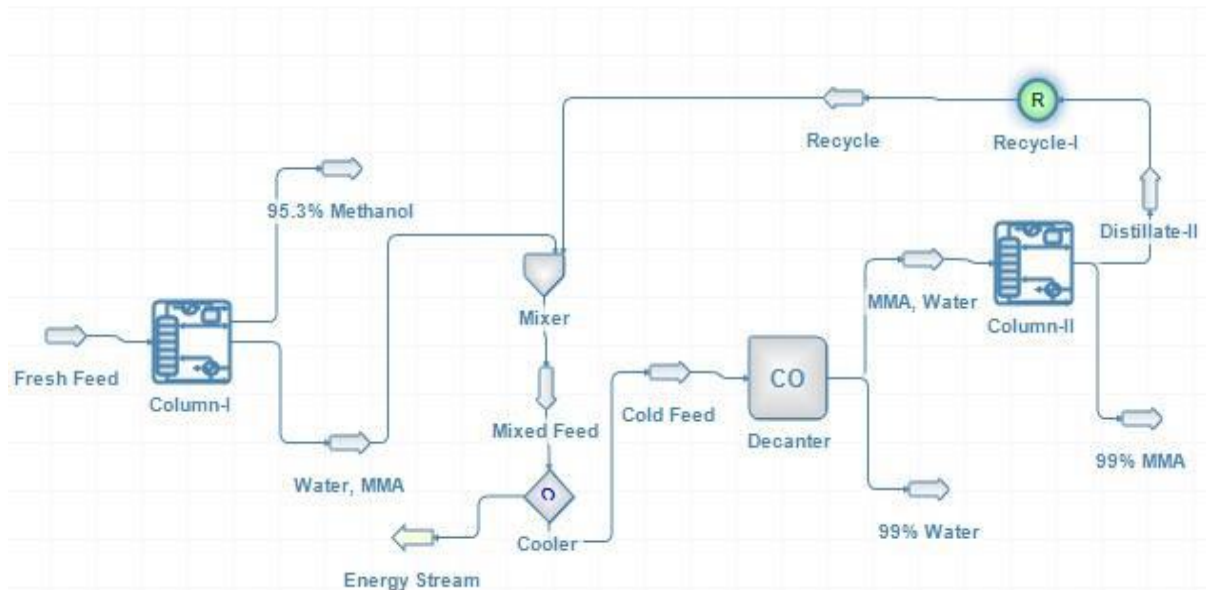


Figure-I

Results:

Stream Properties										
Object	Water, MMA	Mixed Feed	MMA, Water	Fresh Feed	Distillate-II	Cold Feed	99% Water	99% MMA	95.3% Methanol	
Temperature	354.744	371.276	323.15	298.15	371.449	323.15	323.15	373.166	339.503	K
Pressure	1	1	1	1.2	1	1	1	1	1	atm
Molar Flow	26.8142	41.053	28.4814	100	14.2407	41.053	12.5717	14.2407	73.1858	kmol/h
Molar Fraction (Mixture) / Water	0.466109	0.451756	0.213151	0.125	0.424741	0.451756	0.992319	0.00156119	2.25913E-05	
Molar Fraction (Mixture) / Methyl methacrylate	0.532791	0.548975	0.784589	0.1771	0.57074	0.548975	0.00539054	0.998438	0.04678	
Molar Fraction (Mixture) / Methanol	0.0011	0.00226902	0.00226902	0.6979	0.00451827	0.00226902	0.00226902	1.10716E-05	0.963197	

Reference:

[1] Energy-Saving Design and Control of a Methyl Methacrylate Separation Process

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<https://pubs.acs.org/doi/abs/10.1021/acs.iecr.6b00391>