INTRODUCTION

Extractive distillation is a method to separate component of mixture that exhibits azeotropic behavior, that mixture cannot be separated with conventional distillation because its relative volatility is approximately unity, to separate such kind of mixture an additional component is added as entrainer into the mixture.

Dimethyl carbonate(DMC) and methanol(MeOH) is widely used as intermediate in industries and also used in cosmetics, medicines, household goods, diesel fuel additive and pesticides. Dimethyl carbonate (DMC) and methanol (MeOH) mixture is getting separated by extractive distillation using phenol as an solvent

PROCESS:

A mixture of dimethyl carbonate(DMC) and methanol having mole 0.1467 and 0.8533 respectively feed to the 50^{th} stage of 60 stage extractive distillation column with solvent phenol feed to the 5^{th} stage of same column presence of phenol alters relative volatility of methanol-DMC mixture and cause the 0towards the bottom of the column. The mixture is feed to the 7^{th} stage of 32 staged solvent recovery column to get almost pure DMC (0.99 mol%) and bottom product is send back to Extractive distillation column as a recycle with make up phenol

RESULT:

Object	feed	Recycle stream	phenol	methanol	DMC	
temperature	298.15	454.41464	454.41464	337.76889	362.23558	K
Pressure	1	1	1	1	1	atm
Maas flow	6914.927	3263.3481	3263.3481	4655.5191	2256.6122	Kg/h

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Molar flow	170.5	34.676271	34.676271	145.03154	2256.6122	Kmol/h
Phenol	0	0.999	0.999	7.3913779E-07	2.1125682E-06	
methanol	0.8533	2.4667194E-16	2.4667194E-16	0.999	0.023632	
dimethyl carbonate	0.1467	0.001	0.001	0.00099926086	0.9763589	

CONCLUSION

Engineers are always in a relentless pursuit of a better entrainer when dealing with difficult separation problem involving extractive distillation. To minimize time-consuming and expensive development effort, a three tired holistic approach has been proposed in study for creating alternative methanol + dimethyl carbonate separation systems by extractive distillation

There are several solvent in this process like dimethyl oxalate, ethyl benzoate, methyl salicylate Phenol is favorable solvent as compare to other for separation of MeOH+DMC mixture in terms of the total annual cost associated with both conventional and heat-integrated extractive distillation

REFERENCES

Chi-chih hu, shueh-hen cheng, development of alternative methanol/dimethyl carbonate systems by extractive distillation – A holistic approach.chemical engineering research and design CHERD 2820