

Study about advanced control strategies of extractive distillation for the separation of close-boiling mixtures in dimethyl carbonate production process

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In this study, an economical separation process via reactive distillation(RD) column and extractive distillation(ED) column is designed and simulated to obtain pure dimethyl carbonate(DMC) product by using aniline as an entrainer. DMC can be produced by a transesterification reaction in RD column efficiently, and coproduct ethylene glycol(EG) is also produced. To maintain the product purity despite of various feed disturbances the advanced control strategies are needed. Since typical PID control can not maintain product purity, moreover it is easier to induce oscillation or instability.

In the steady state simulation, optimal operating condition and location of stage for temperature control were found. Particularly this work focuses on the overall control and tuning strategies using dynamic simulation. As a result, advanced control strategies significantly improve the process operability and controllability.