

### Dynamic Study of a Reactive Batch Distillation Column

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In this study theoretical work is discussed for the Modeling and Simulation of the operation of a reactive batch distillation (RBD) column. The study is performed to develop an improved dynamic model based on MESH equations. Model includes the reaction term for the general reaction in MESH equations taken together as MESHHR equations. A dynamic model is developed for time varying distillate and column hold up that result in the highly non-linear coupled ordinary differential algebraic equations (DAEs). The RBD model containing set of DAEs, are solved by using MATLAB. The optimum value of reflux ratio and the operation batch time are obtained. The simulation is then carried out for the optimum reflux ratio and the total batch time. A case study on esterification reaction was carrying out to test the model for the given feed conditions. The results obtained are presented and discussed to describe the dynamics performance of the reactive distillation (RD) column. "This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (2012012532)".