

AN ABSTRACT OF A THESIS

SIMULATION OF A REACTIVE DISTILLATION PROCESS FOR PRODUCING BUTADIENE SULFONE

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Master of Science in Chemical Engineering

A reactive distillation process for producing butadiene sulfone was simulated using the Advanced Continuous Simulation Language (ACSL). The main objective of this study was to test the ACSL for modeling reactive distillation by defining all trays to be generic and to use CHELIB, a library of subprograms at Tennessee Technological University, to minimize the code.

ACSL proved to be a much easier language to write than other languages such as Fortran. Very few assumptions were made while writing the model. The study showed that, due to wide boiling points of the components and kinetics of reactions, a two-column setup was needed. The columns were arranged in series. That is, the product from first column was fed to the second column and the recycle stream from the second column was fed to the first column. The number of stages in the columns were twenty and five, respectively. The pressure in column one was high to facilitate reaction and the pressure in column two was low to facilitate purification. The required purity of butadiene sulfone was 98.5 mole percent and it was achieved in twenty-five hours and it increased slowly with time. The conversion achieved was 99.5 percent, based on butadiene.

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FOR PRODUCING BUTADIENE SULFONE**

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CERTIFICATE OF APPROVAL OF THESIS

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