



## Studying the Dynamics of a FAME Reactive Distillation System towards some input types

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**Abstract :** This work has been carried out to study the dynamics of a fatty acid methyl ester reactive distillation process upon the application of some input types. The fatty acid methyl ester used as a case study was methyl oleate, which was produced from the esterification reaction between methanol and oleic acid. The dynamics study was accomplished using the first order transfer function model of the process developed with the aid of System Identification Toolbox of MATLAB from the data generated using the prototype plant of the process set up with the aid of Aspen HYSYS. The results obtained from the data generation showed that Aspen HYSYS was successfully used to study this system, the experimental setup of which was not available. In addition, the results obtained from the simulation of the transfer function model revealed that the system was a stable one because it was able to get to a steady state when each of constant, step and pulse input variable changes were applied to it. Therefore, it has been demonstrated that, besides the step input that is most commonly used in studying the dynamics of a system, other input types such as constant, ramp, pulse and repeating sequence can as well be applied.

**Keywords:** Reactive distillation, fatty acid methyl ester (FAME), Aspen HYSYS, transfer function model, MATLAB, constant input, step input, pulse input.

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