Chonthida Naummaneerat 2009: Kinetics Study of the Alkaline Hydrolysis of Ethyl Acetate in CSTR Using Simultaneous Temperature Scanning and Composition Modulation Technique. Master of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Assistant Professor Attasak Jaree, Ph.D. 64 pages.

This work presents a new technique for reaction kinetic studies of liquid phase reactions in a CSTR. The technique simultaneously varies the reaction temperature (Temperature Scanning) and reactant feed concentration (Composition Modulation) while collecting the output concentration. Alkaline hydrolysis of ethyl acetate was chosen to demonstrate the technique. Time-evolved output concentration of the system was used as a basis for comparison in the analysis. The reaction kinetics in the form of power-law model and Arrhenius equation with different sets of parameters including reaction order, activation energy, and preexponential factor was simulated under transient conditions as experimentally performed. The set of parameters resulting in the minimum sum of squared errors was selected. These values were comparable to those reported in literature. The technique saves time and experiment resources.

_____ _____ ___ / ___ / ___

Student's signature Thesis Advisor's signature