

AN ABSTRACT OF A THESIS

EFFECT OF EVOLVED GASES ON A PLUG FLOW REACTOR

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Master of Science--Chemical Engineering

The effect of evolved gases on a chemical reaction taking place in a tubular reactor of 0.5-inch inside diameter and 32-foot length was studied. Three different reactions were run at different Reynolds numbers and experimental results were compared to several mathematical models describing reaction rates for laminar flow in a tubular reactor.

The hydrolysis reaction of ethyl acetate and sodium hydroxide in the reactor operating at Reynolds numbers of 300 to 1400 is in general agreement with Denbigh's (1951) laminar flow model. When fine air bubbles were introduced into the reactor, the efficiency of the reactor was lowered.

The reaction of sodium bicarbonate with an excess amount of ethylene chlorohydrin, a pseudo first-order reaction with gases generated, was run in the reactor. The conversion of this reaction in the laminar region was found to be lower than that expected from Cleland and Wilhelm's (1956) laminar flow model.

In the reaction of sodium carbonate with ethylene chlorohydrin, the efficiency of the reactor was lowered when the initial concentration of the reactants was increased.

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A Thesis

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In Partial Fulfillment  
of the Requirements for the Degree  
MASTER OF SCIENCE  
Chemical Engineering

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by

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To the Faculty of the Graduate School:

I am submitting herewith a thesis written by Ju-Fu Shiau entitled "Effect of Evolved Gases on a Plug Flow Reactor". I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Chemical Engineering.

*William D. Holland*

Major Professor

We have read this thesis and recommend its acceptance:

*John C. McGee*  
*[Signature]*

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