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SLURRY REACTOR HYDRODYNAMICS STUDIES: FINAL REPORT

AIR PRODUCTS AND CHEMICALS, INC.
ALLENTOWN, PA

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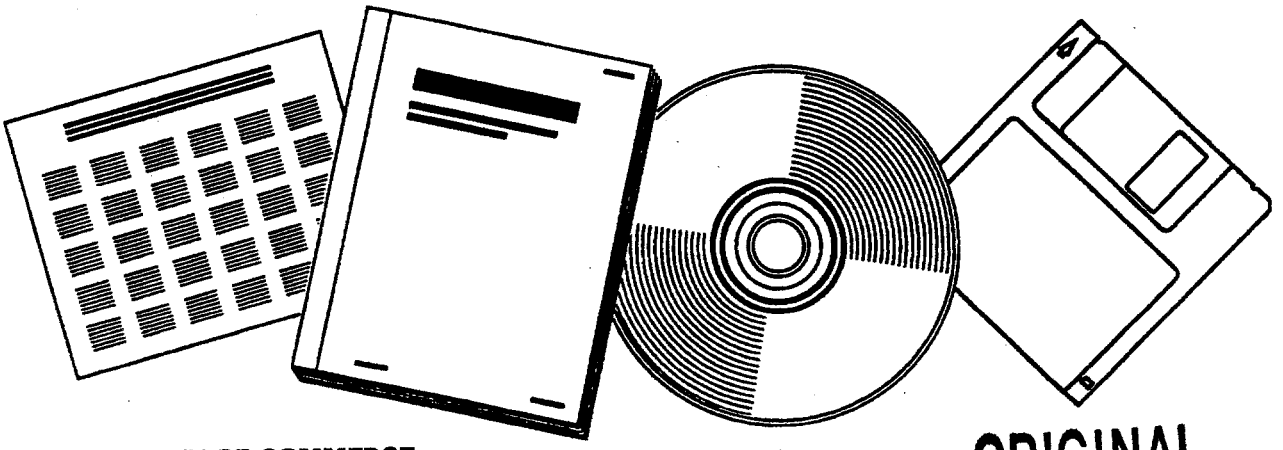

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SLURRY REACTOR HYDRODYNAMICS STUDIES

FINAL REPORT

Work Performed Under
DOE Contract No. DE-AC22-80PC30021

Air Products and Chemicals, Inc.
Allentown, PA 18195

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Abstract

Air Products has completed a three-year DOE contract in which new slurry phase catalysts (Task 2) and slurry phase bubble column reactor correlations (Task 3) for the Fischer-Tropsch synthesis were developed. This report presents results from the reactor studies.

Using both a 12.7 and a 30.5 cm diameter cold flow simulator, phase holdups, phase dispersion coefficients, and interphase heat and mass transfer coefficients were measured and correlated. This information was incorporated into a computer model of a three-phase bubble column. The heat and mass transfer and phase dispersion correlations were found to conform to the literature, while the phase holdup correlations were different. Combining product distributions from the Task 2 catalyst tests with the results of the Task 3 hydrodynamic studies allowed prediction of space-time yields of product fuel fractions in larger-scale slurry bubble columns.

Slurry Reactor Hydrodynamic Studies Final Report

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