DOE/PC/90291--T13

# DESIGN OF A HIGH ACTIVITY AND SELECTIVITY ALCOHOL CATALYST

**Final Status Report and Summary of Accomplishments**


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Date Published:
July 15, 1994

Prepared for
Fossil Energy
Department of Energy

Under Award No. DE-FG22-90PC 90291




Bd final

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July 27, 1994

Ms. Donna J. Lebetz, MS 921-118
U.S. Department of Energy
Pittsburgh energy Technology Center
Acquisition and Assistance Division
P.O. Box 10940
Pittsburgh, PA 15236-0940

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Re: Grant No. DE-FG22-90PC90291
U of d No. 3-7-21-3119-12
Principal Investigator: Dr. Henry C. Foley

Dear Ms. Lebetz:

Enclosed please find the original final technical report for the above referenced grant for Dr. Henry C. Foley, Principal Investigator.

If you should have any further questions, please contact me at (302) 831-2060.

Sincerely,

Malinda Yarnell

Malinda Yarnell
Accountant

cc: Dr. Henry C. Foley
Principal Investigator

Susan Tkachick
Sponsored Programs Administration, UOD

## Report Overview

This final DOE report for grant award number DE-FG22-90PC 90291 presents the results of our efforts to better understand the Rh-Mo/$\gamma$-$Al_2O_3$ catalytic system for the hydrogenation of carbon monoxide and carbon dioxide to selectively form oxygenated products. The content of this report is divided into three major sections and a fourth, concluding section which addresses our major research accomplishments, as well as documents the most significant publications and presentations associated with this grant. The three main sections which make up the body of this report are presented in the in form of manuscripts which, in turn, summarize our progress in three areas of this project. The three body sections are organized as follows

Section I: Evidence for Site Isolation in Rh-Mo Bimetallic Catalysts Derived from Organometallic Clusters

Section II: Surface Chemistry of Rh-Mo/$\gamma$-$Al_2O_3$: An Analysis of Surface Acidity

Section III: Comparative Study of Rh/$Al_2O_3$ and Rh-Mo/$Al_2O_3$ Catalysts

Again, following the main body sections, Section IV summarizes major accomplishments. The content of this final report is meant to generally highlight our progress in both characterizing the nature of the Rh-Mo/$Al_2O_3$ system and probing its reactivity for insight on the oxygenate synergy present in this class of catalysts.