# SLURRY PHASE IRON CATALYSTS FOR INDIRECT COAL LIQUEFACTION

Contract No. DE-FG22-95PC95210--05

to

The University of New Mexico

7/5/94 - 7/4/98

Fifth Semi-Annual Progress Report

Covering the Period from 7/5/97 - 1/4/98

## Prepared for

U.S. Department of Energy Federal Energy Technology Center FETC Project Manager: Richard E. Tischer

### Submitted by

Abhaya K. Datye, Professor
Department of Chemical & Nuclear Engineering and
Director, Center for Micro-Engineered Materials
University of New Mexico
Albuquerque, NM 87131
submitted September 10, 1998

# **Disclaimer**

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

### **Disclaimer**

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, or service, by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

### **Abstract**

This report describes research conducted to support the DOE program in indirect coal liquefaction. Specifically, we have studied the attrition behavior of Iron Fischer-Tropsch catalysts, their interaction with the silica binder and the evolution of iron phases in a synthesis gas conversion process. The results provide significant insight into factors that should be considered in the design of catalysts for the conversion of coal-derived synthesis gas into liquid fuels.

Table of Contents	page
Executive Summary	
Technical Objectives	
Task 1	
Task 2	
Task 3	
Technical Progress	
Task 1	
Task 2	
Task 3	
Acknowledgments	
References	
Figures	7-13
Appendix A	
Characterization of Slurry Phase Iron Catalysts for Fischer-Tro	
ABSTRACT	
Introduction	
Experimental	
Results	
Summary	
Conclusions	
Acknowledgments	
References	
Figure Captions	
Tables	A.22 - A.25
Figures	A.26 - A.42