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PARTICLE SYNTHESIS AND PROPERTIES OF ZEOLITE CATALYSTS FOR SYNTHESIS GAS-GASOLINE CONVERSION

Final Report for the Period February 18, 1981—February 17, 1984

By
Glenn W. Dodwell
L. B. Sand

June 15, 1984

Work Performed Under Contract No. FG22-81PC40773

Worcester Polytechnic Institute
Worcester, Massachusetts

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ABSTRACT

Conventional Shultz-Flory catalysts suffer from the inherent non-selective product distributions of Shultz-Floryian kinetics. Development of the Mobil M technology is the first major breakthrough in synthetic fuel technology in 5 decades. To utilize the Mobil M technology, synthesis gas produced from the gasification of coal must first by converted to methanol. The high pressures and/or high recycle ratios necessary because of the thermodynamics of the methanol synthesis reaction, make the overall cost of this approach prohibitive in today's economy. The logical extension of the Mobil M technology is to use bifunctional Pentasil based catalysts to provide a single reactor route from synthesis gas to high octane gasoline. Various methods exist to incorporate the CO reduction function with the Pentasil zeolite. The direct synthesis approach which has been largely overlooked by investigators to date, will be emphasized in this research.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES