

Section B: Technical Report

I. Abstract

Commercial Fischer-Tropsch (F-T) processes are limited by deficiencies intrinsic to the metal catalysts used (Fe and Co). These are (1) the predominance of normal paraffins in the product, (2) a small liquid motor fuel fraction formed in the total product, and (3) the formation of oxygenated compounds which cause separation and corrosion problems. Union Carbide believed that substantial improvements could be made based upon recent discoveries of new molecular sieves. It was believed that the combination of the new molecular sieves with the classical F-T catalysts could eliminate these deficiencies.

The initial effort focused on studies of the molecular sieve component alone (Task 1). This resulted in the identification of UCC-108 and UCC-101 (and their variations) as candidates for the production of fuel range hydrocarbons with Fischer-Tropsch catalysts.

The next step (Task 2) was the study of these materials in conjunction with Fischer-Tropsch catalysts to generate fuel hydrocarbons from syngas. A few outstanding candidates were discovered that provided significantly better product yields and quality as well as an improved catalyst stability.

This report summarizes the results of the program.