

SECTION 2 - INTRODUCTION

This study provides an engineering evaluation of four reactor systems available for indirect liquefaction of coal via Fischer-Tropsch technology. The four reactor systems include the following:

1. The entrained bed reactor, originally developed by the M. W. Kellogg Company and operating commercially at Sasol.
2. The tube-wall reactor, developed by the U.S. Bureau of Mines.
3. The slurry reactor, developed by H. Koelbel and others.
4. The ebullating bed reactor, developed by the U.S. Bureau of Mines and also utilized by Chem Systems.

The evaluation consists of kinetic and physical comparisons. In the kinetic comparison, computer models of the first three systems are utilized to identify inherent differences in the reactors. Studies using the slurry reactor model also allow tentative conclusions regarding the ebullating bed reactor.

For the physical comparison, conceptual designs of each of the reactor systems allow estimation of investment costs, product yields, thermal efficiencies and other operational differences.