

90-165909/22

E17 H04

BROKEN HILL PTY LTD

22.11.88-AU-001579 (30.05.90) B01j-29/06 C07c-01/04

Fischer-Tropsch catalyst converting synthesis gas to liq. fuel - has zeolite support of small crystal size below 5 microns and inhibits increase in methane prodn.

C90-072306

BRHI 22.11.88

*GB 2225-255-A

E(10-J2D) H(4-E5, 4-F2E) N(2, 3-A, 0-D, 0-C)

PREFERRED CATALYST

The catalyst is pref. activated before use and pref. contains 1-50 wt. % and 0.01 - 25 wt. % of thoria.

REACTION CONDITIONS

The mol. ratio of H₂:CO in the synthesis gas is pref. 0.2-6 and reaction conditions are pref. 200-350°C/0-5 (esp. 1-3.5) MPa at space velocity 10-10,000, pref. 50-500 hr⁻¹.

EXAMPLE

A catalyst giving a 76.9% conversion with 83% C₂+ selectivity and without increase in methane prodn. comprised 100 pts. Co and 10 pts. Th (both added as nitrates) on 1000 pts. small crystal zeolite of ZSM-5 type with ave. approx. dia. 0.5µ.

The zeolite was prepd. by mixing together (i) a soln. prepd. from 180g tetrapropylammonium hydroxide, 300g water and 528g Ludox (RTM: 40% SiO₂) and (ii) a soln. consisting of 7.5g Na aluminate and 30g NaOH in 300g water followed by maintaining at 100°C for 6 days. (21pp1958CGDwgNo0/1).

The novel feature in a Fischer-Tropsch catalyst for conversion of synthesis gas into hydrocarbons suitable for use as liq. fuels is that the active metal is supported on an acidic crystalline zeolite of ave. crystal size below 5 microns, pref. 1 micron or less.

The zeolite is pref. a ZSM-5, -11, -12, -35 or -38 with the active metal pref. being Fe, Co, Ni or Ru in an amt. of 1-50 wt. %, opt. promoted by 0.01 - 25 wt. % of thoria or other basic oxides.

ADVANTAGES

By using a small size zeolite support, redns. in the heaviness of the prod. accompanied by an increase in hydrocarbon branching can be obtd. without a subsequent increase in methane prodn.

GB2225255-A