

88-086135/13

A17 E37 H04 H06

BRPE 26.09.86

BRITISH PETROLEUM PLC

\*EP -261-870-A

26.09.86-GB-023233 (30.03.88) B01j-23/80 C07c-01/04

Compsns. contg. cobalt and zinc - of use after reductive activation as catalysts for conversion of synthesis gas to higher hydrocarbon(s)

C88-038583 R(BE DE FR GB IT NL)

A(1-D13) E(10-J2C3) H(4-E5, 4-F2E) N(2, 3)

x satisfies valence requirements.

USE/ADVANTAGE

(I) and (II) are of use in converting synthesis gas to higher, e.g. 5-60C, hydrocarbons, esp. wax range hydrocarbons; make of CO<sub>2</sub> and oxygenates is very low. The products or a portion thereof may be upgraded by oligomerisation of lower olefins therein to higher hydrocarbons, hydrocracked, or cracked and isomerised.

PREPARATION

(I), or (II), may be prepd. by a variety of conventional methods. The pref. method (claimed) is to precipitate Co and Zn at 0-100°C as decomposable cpds. using a precipitant NH<sub>4</sub>OH, (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> or bicarbonate, a tetraalkylammonium hydroxide or an organic amine; the two metals may be precipitated together or sequentially. The ppte. is recovered, and opt. heated at 250-500°C in a stream of nitrogen or air. Reductive activation comprises heating at 150-500°C, 1-100 bar, with a reducing gas.

EXAMPLE

A solution of 50.0 g cobaltous nitrate and 102.2 g zinc

EP-2C1870-A+

A compsn. (I), for use after reductive activation as a catalyst for the conversion of synthesis gas to higher hydrocarbons, comprises

- (i) Co, as metal, oxide or a cpd. thermally decomposable to metal or oxide, and  
 (ii) Zn, as the oxide or a cpd. thermally decomposable thereto.

A compsn. (II) is, after thermal decomposition of thermally decomposable cpds., represented by formula (III)



M = Ni, Fe, Mo, W, Zr, Ga, Th, La, Ce, Ru, Re, Pd and/or Pt;

a = from above zero to 70 wt.%;

b = 0-15 wt.%;

c = above zero;

nitrate in 1 dm<sup>3</sup> water was added slowly to a soln. of 215 g ammonium bicarbonate in 2 dm<sup>3</sup> water stirred at room temp. The ppte. was collected, washed and dried in 150°C. The product was heated in nitrogen at from 20 to 450°C and then in hydrogen at a temp. increasing from 20 to 320°C.

Synthesis gas (H<sub>2</sub>:CO 2:1) was passed over the catalyst at 30 bar, 216°C, GHSV 2500. Conversion of CO was 64.2%, and molar % selectivities CO<sub>2</sub> 0.5, CH<sub>4</sub> 9.1, C<sub>3</sub><sup>+</sup> 89.6, oxygenates 0.1. (12pp1644CGDwgNo.0.0).

(E) ISR:- US4107091; DE2625541; EP--55512; EP-153780; GB2125062

EP-261870-A