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UNION CARBIDE CORP *WO 8600-295-A
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Fischer-Tropsch process giving lower selectivity to methane - and higher selectivity to liq. engine fuels by using catalyst contg. cobalt with gold copper or silver as inert metal component

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E(10-J2D3) H(4-D, 4-E5) N(2-B1, 2-D1, 2-E, 6-A)

Synthesis gas is converted to 5C+ hydrocarbon mixts. useful as liq. motor fuels by contacting at 240-370°C with a Fischer-Tropsch catalyst comprising:
(a) Co mixed with
(b) an inert metal component comprising Au, Ag, Cu or their mixts., the concn. of (b) being 0.1-50 mole % of (a+b).

ADVANTAGE

Component (b) decreases the selectivity of conversion to methane (e.g. from 24.1 to 17.8%), and increases that to liq. fuels (e.g. that of the 420 to 700°F fraction from 15.8 to 24.0%). The liq. no longer contains solid prods.

PREFERRED CATALYST

The content of inert metal is pref. 0.5-5 mole % of that of Co. The Co may be promoted with K, Th or Na. There may also be a co-catalyst/support component, comprising (c) a steam-stabilised hydrophobic zeolite Y, esp. one in Al-extracted form (prepd. e.g. as in US3591488) in which the Co is placed largely within the crystallites; and/or (d) a crystalline microporous SAPO silicoaluminophosphate non-zeolitic mol. sieve (US 4480871).

If a cocatalyst/support is used, the concn. of Co is pref. 1-25 (esp. 5-15) wt. % of the catalyst.

CATALYST PREPARATION

The Co metal compomnent (e.g. cobalt carbonate) can be impregnated with a soln. contg. the inert metal component, e.g. as $HAuCl_4$, after impregnating with a soln. of the promoter element, e.g. as $Th(NO_3)_4$, and then mixed with UHP-Y zeolite and SiO_2 binder, and the mixt. extruded, dried and calcined. Or the Co component can be adsorbed within the zeolite crystals.

EXAMPLE

Catalysts comprised: (i) (comparative) 15 wt. % (Co + 15 wt. % Th), 70 wt. % UHP-Y zeolite and 15 wt. % SiO_2; and (ii) the same, with addn. of 2 wt. % Au relative to cobalt oxide.

The catalysts were used in conversion of a 1 : 1 CO/H_2

mixt. at 270°C, 300 psig and GHSV 300. Some results after about 200 hr. are given above (ADVANTAGE). Catalyst (ii) showed 36.25% conversion of CO.
(36pp1492RHDwgNo0/0).
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