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SHEL 28.02.84

SHELL INT RES MIJ BV

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Hydrocarbon(s) prodn. from hydrogen-lean synthesis gas - over mixt. of cobalt Fischer-Tropsch and copper zinc catalysts, with mixt. compsn. defined in terms of gas ratio

CR5-095145

D/S: AT BE DE FR IT NL SE

Prodn. of hydrocarbons from a mixt. of CO and H₂ with H₂/CO molar ratio (F) = 0.25-1.0 comprises contacting at high temp. and pressure with a mixt. of catalysys. (A) and (B); where

(A) contains 3-60 pts. wt. Co, 0.1-100 pts. wt. of one or more of Zr, Ti and Cr, and 100 pts. wt. of SiO₂, Al₂O₃ or SiO₂-Al₂O₃, and has been prepd. by kneading and/or impregnation; and

(B) contains Cu and Zn in atomic ratio Cu/Zn = 0.1-10; and the mixt. atomic ratio (Cu+Zn)/Co lies between 0.5(2-F)/(1+F) and 5(2-F)/(1+F).

USE/ADVANTAGE

The prod. is a waxy mixt. of unbranched paraffins, partly of higher b.pt. than middle distillates, which can be hydrocracked (pref. as the C₅₊ prod. without further sepn.) to give a mixt. of gasoline and middle distillates. Unusually, the

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E(10-J2D)H(4-E5, 4-F2E)N(1-C1, 1-D, 2, 2-B), 2-D, 3-B, 3-D, 3-F) 091

mixed catalyst gives good conversions of these H₂ lean feeds e.g. at F = 0.55, a (CO+H₂) conversion of 91 mole % with selectivity to C₅₊ of 86 wt. %.

WIDER DISCLOSURE

Mixts. of low H₂/CO ratio (0.75-1.75 molar) can alternatively be converted by first converting over a Co catalyst, the remaining CO and H₂ then being converted over a bifunctional catalyst or catalyst combination which is active both for conversion of CO and H₂ to hydrocarbons and for that of CO and H₂O to CO and H₂ (NL Application K 5733).

PREFERRED CATALYST

Catalyst (A) is pref. that of NL 8301922, satisfying the relation

$$L/S \text{ lies between } (3/4R) \text{ and } (0.3+0.4R),$$

where L = catalyst Co concn. (mg/ml),

S = surface area (m²/ml);

R = fraction of the Co deposited by kneading.

Further, (A) contains, per 100 pts. wt. carrier (pref. SiO₂), 15-50 pts. wt. Co and, of the other metal (pref. Zr), 0.1-5 pts. wt. if Co is deposited first but 5-40 pts. wt. if the other

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metal is deposited first.

In catalyst (H), the Cu/Zn atomic ratio is pref. 0.25-4; and there is e.g. an Al_2O_3 carrier.

PREFERRED CONDITIONS

The mixt. of H_2 and CO may be contacted with the catalyst at 125-350 (esp. 175-275) $^{\circ}C$ and 5-100 (esp. 10-75) bar. (12pp1492RHDwgNo. 0/0).

(E) ISR: No Search Report