

91124

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 SHELL INT RES MIJ BV *BE-888-923
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 Middle distillate prodn. from synthesis gas - using catalyst
 comprising cobalt and zirconium, titanium or chromium on silica

H(4-E5) N(2-B, 3-B, 3-D)

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Prodn. of middle distillates is carried out by
 (a) contacting synthesis gas with a Co catalyst (I) at elevated temp. and pressure, the reaction being effected in the presence of H₂O and a shift conversion catalyst (II) when the H₂/CO molar ratio is less than 1.5, and
 (b) catalytically hydrotreating the product, or at least that portion having an initial b.pt. above the end b.pt. of the heaviest middle distillate desired as end product.
 Specifically, (I) contains 10.40 pts. wt. Co and 0.25-5 pts. wt. Zr, Ti or Cr per 100 pts. wt. of SiO₂ and is prepd. by impregnating SiO₂ with one or more aq. solns. contg. salts of the relevant metals, drying, calcining at 350-700 deg. C, and reducing at 200-350 deg. C.

DETAILS

Catalysts (I) and (II) can be used as a physical mixt. or as alternate layers in a catalyst bed. (II) is pref. a Cu- and Zn-contg. catalyst with a Cu/Zn atomic ratio of 0.25-

4.0.

The synthesis gas can be produced by steam gasification of carbonaceous material, opt. followed by shift conversion (without CO₂ sepn.). Alternatively, unreacted synthesis gas sepd. from the effluent of another process for hydrocarbon or oxygenate synthesis can be used.

Step (a) is pref. effected at 125-350 (esp. 175-275) deg. C and 1-150 (esp. 5-100) bar.

Step (b) is pref. effected at 175-400 (esp. 250-350) deg. C and 10-250 (esp. 25-150) bar, with a space velocity of 0.1-5 (esp. 0.25-2) kg/l. hr and an H₂/oil ratio of 100-5000 (esp. 250-2500) NI/kg., using a catalyst comprising 0.1-2 wt. % Pt-group metal on a support comprising 13-15 wt. % alumina and 85-87 wt. % silica. (28pp367).

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