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EXXON RES & ENG CO

*EP -339-923-A

25.04.88-US-185953 (02.11.89) B01j-23/74 C07c-01/04

Hydrocarbon synthesis over cobalt titania improved by water addn.
 • for increased proportion of heavy hydrocarbon(s) and olefin(s),
 and decreased methane

C89-140708 R(DE GB NL SE)

E(10-J2D3) H(4-E5, 4-F2E) N(2-B1, 3)

EXAMPLE

Catalyst 12% Co/TiO₂, total pressure 20.7 atmos.
 Feedstock 63.9% H₂, 32.1% CO, 4.0% N₂. Temperature 200°C.
 C₅+ hydrocarbons increased from 79.3 to 90.4% at high flow
 rate and 84.4 to 92.1 at low flow. CO conversion at high flow
 rate increased from 8.5 to 21.9%, low flow rate from 40.2 to
 50.7%. CH₄ selectivity decreased from 9.6 to 4.1 and from
 6.5 to 2.7. 1-olefin/paraffin ratio increased from 1.24 to 2.38
 and from 0.84 to 2.00. (8pp2055RKMHDwgNo0/0).
 (E) ISR: FR2388782; US4595703; EP-109702; EP-216967;
 EP-266898;

C₅+ hydrocarbons are produced by addn. of H₂O to the H₂
 and CO feedstock for a reaction catalysed by cobalt supported
 on titania at a temp. of at least 100°C, pref. at least 150°C
 Co content is 2-25 wt.%. Feedstock water content is 1-70
 vol.%, pressure is above 1 atm. The H₂O is in addn. to that
 formed from CO and H₂ and may be added as an H₂O precursor
 e.g. 1-6C alcohols. The catalyst may be promoted, metal
 selected from Re, Hf, V, Nb, Ta, Cr, Zn, lanthanides or
 mixts. Re content is greater than 0.01-1 wt.%. Mol. ratio
 H₂/CO 0.5-6.

Process improves as pressure increases and CO conversion
 decreases.

USE/ADVANTAGE

Hydrocarbon synthesis is improved. Increase of C₅+
 hydrocarbons and CO conversion, decrease in CH₄ prodn.
 Increase in 1-olefin/paraffin ratio.

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