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BRIT PETROLEUM CO (BROP/)

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Prod'n. of hydrocarbon(s) by fischer-tropsch reaction from feed mixt. - comprises carbon monoxide, hydrogen and unsatd. hydrocarbon which increases output per pass

C86-120543 N(JP NO US)

E(10-J2D) H(4-E5) J(4-E1) N(1-C, 2, 3, 6-B)

and/or reduces the proportion of CO₂ and CH₄ produced.**PREFERRED FEED MIXTURE**

The unsatd hydrocarbon pref has concn. 1-40 mole % and is C₂H₄

FEED PRODUCTION

The synthesis gas component of the feed may be made from a satd hydrocarbon and an O₂-contg gas, in stoichiometric ratio above that for complete combustion in a spouting particulate bed of material having catalytic activity for partial oxidn or steam reforming.

Alternatively the required mixt of unsatd hydrocarbon, CO and H₂ may be made in a bed of inert particulate material through which (a) a mixt of a satd hydrocarbon with an O₂-contg gas at a stoichiometric ratio above that for complete combustion is passed upwards at a rate high enough to fluidize or produce a spouting action of the bed; or (b) a mixt. as in (a) with the addn of H₂ is passed upwards at a rate sufficient to cause spouting.

PREFERRED CATALYSTS

The Fischer-Tropsch catalyst pref comprises Gp VIII

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Full Patentees: British Petroleum Co. plc. Brophy JH (for US only).

The prodn of a hydrocarbon prod. comprises contacting a gas mixt. contg. CO, H₂ and unsatd. hydrocarbon(s), the concn of unsatd hydrocarbon being less than 50 mole %, with a Fischer-Tropsch catalyst.

The CO/H₂ mixt. and the unsatd hydrocarbon may be prepd separately and then mixed over the catalyst or the 3-component mixt may be prepd in one stage by partial oxidn.

Pref. catalysts incorporate acidic gallosilicate or aluminosilicate zeolites.

USE/ADVANTAGE

Addn of the unsatd hydrocarbon (e.g. C₂H₄) to the Fischer-Tropsch feedstock can greatly increase the C conversion per pass; and with some catalysts there is synergism in that the unsatd hydrocarbon increases CO conversion

metal(s) as metal, oxide or sulphide esp. Fe, Co or Ru supported on Al_2O_3 , C, SiO_2 , ZrO_2 , TiO_2 , MgO, CeO_2 or Ga_2O_3 . The catalyst may also contain a solid acid, esp. a crystalline aluminosilicate or gallosilicate zeolite with SiO_2 : Al_2O_3 ratio above 12:1.

More specifically, the catalyst comprises Ru and CeO_2 , pref. with an MFI-type acidic aluminosilicate zeolite. Also claimed is a mixt. of an oxide of Zn, Ga or Ir and at least one other metal, with a porous crystalline tectometallosilicate.

EXAMPLE

Feed mixts. were passed over a $\text{ThO}_2/\text{Ga}_2\text{O}_3/\text{H-MFI}$ zeolite catalyst at 50 bar, GHSV 2,000 and 400 °C.

Feeds comprised: (X) 65% H_2 , 35% CO; and 57% H_2 , 33.5% CO, and 9.5% C_2H_4 .

The productivity of 3C+ hydrocarbons (g/l x h) was (X) 62, (Y) 319; and their yield (%) was (X) 17, (Y) 47. (22pp1497 RBHDwgNo0/0).

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