

90-163484/21

H04 (H06)

ESSO 18.12.87

*US 4919-786-A

EXXON RES & ENG CO

13.12.88-US-283681 (+US-134960) (24.04.90) C10g-65/12

C10g-67/02 C10g-73/38

Hydro-isomerisation of wax to obtain middle distillate - in presence of fluorided gp. VIII metal- on alumina catalyst
C90-071262

H(4-E, 4-E8)

(iii) a N/Al ratio less than 0.005.

USE

The feed material is a Fischer-Tropsch wax (esp.) or hydrotreated petroleum slack wax. Middle distillate prods., boiling within the range 320-700°F, are of use as jet or diesel fuels.

PROCESS

Virgin Fischer-Tropsch wax is distilled in column (D-1) to obtain a low boiling fraction containing water and olefinic-oxygenate components, and a high boiling fraction containing less than 0.3 wt. % oxygen. The latter fraction and hydrogen are contacted with a fixed bed of fluorided platinum-on alumina catalyst in reactor (R-1) at 650-700°F, LHSV 0.5-1, 500-1000 psig, hydrogen 4000-7000 SCF/B. The effluent is fractionated at (D-2) into low boilers (gas and naphtha), two middle distillate fractions, and a bottom product. Part of the latter is subjected to further hydroisomerisation in reactor (R-3) using a similar catalyst, and the product fractionated to obtain further fractions boiling below 700°F, a lube oil fraction (700-959°F), and a bottom product which is recycled

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Middle distillate fuel (I) is produced from a paraffin wax by:

(a) contacting the wax with hydrogen in a hydroisomerisation zone in presence of a fluorided Gp. VIII metal-on-alumina catalyst, to convert 50-95 wt. % of the 700°F + material in the wax, thereby maximising prodn. of (I); and

(b) recovering (I) and a bottoms prod. of initial b.pt. above 700°F;

The catalyst has:

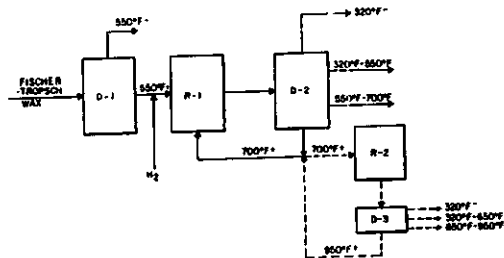
(i) a bulk fluoride concn. 2-10 wt. %; fluoride concn. is less than 3.0 wt. % at the outer surface to a depth less than 0.01 in. and the surface fluoride concn. is less than the bulk fluoride concn.;

(ii) an aluminium fluoride hydroxide hydrate level greater than 60, where a level of 100 corresponds to the X-ray diffraction peak height at 5.55 Å for a reference standard; and

to one of the reactors.

CATALYST PREPARATION

A metal-on alumina catalyst is prep'd. by conventional co-precipitation or impregnation and calcination, and then contacted with an aq. solution containing 10-20% hydrogen fluoride; the hydrogen fluoride is largely adsorbed at an inner layer below the outer surface. Product is then heated at not more than 650°F, e.g. at 300°F; the inner platinum-fluoride layer contains a high concn. of aluminium fluoride hydroxide hydrate. (13pp1644RBHDwgNo1/5).



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H06 (H04)

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H(2-A1, 4-A7, 4-A10, 4-D3, 4-F2D) N(1-C2, 2, 4-D)

EXXON RES & ENG CO

*EP -321-303-A

18.12.87-US-134960 (21.06.89) C10g-45/60

Middle distillate prodn. from wax - by isomerisation on fluorided alumina-based catalyst contg. group = VIII metal

C89-079544 R(DE FR GB IT NL)

Prodn. of middle distillates from waxes is effected by hydroisomerisation in the presence of a fluorided Group VIII metal/ Al_2O_3 catalyst to convert 50-95 wt. % of the 700°F+ material.

The catalyst has (a) a bulk F content of 2-10 wt. %; (b) a surface F content (to a depth of less than 0.01 inch) of less than 3 wt. %; (c) an Al fluoride hydroxide hydrate level above 60, where 100 corresponds to the X-ray diffraction peak height at 5.66 Å for a reference standard; and (d) an N/Al ratio below 0.005.

USE/ADVANTAGE

The process is capable of producing high yields of jet fuel (320-550°F.) and diesel fuel (550-700°F.) fractions from petroleum slack wax or Fischer-Tropsch (FT) wax.

PREFERRED EMBODIMENTS

Slack wax is first hydrotreated to remove S and N cpds.

FT wax is first fractionated to remove light oxygenates. The catalyst contains 0.1-2 wt. % Pt and has a hydrate level of at least 80.

The prod. is fractionated to recover 320-700°F middle distillate, and the 700°F+ bottoms prod. is recycled or dewaxed to produce lube oil or passed to a 2nd hydroisomerisation zone to produce lube oil. (14pp367CGDwgNo0/5). (E) ISR: No Search Report.