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 EXXON RES & ENG CO *EP -373-740-A
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**Reduction of wax content of raffinate(s) using hydro:isomerisation -
 with low fluorine catalyst after hydro:treating the raffinate, useful
 for higher wax content feeds**
 C90-081127 R(BE DE ES FR GB IT NL)

H(4-A7, 4-A10, 4-E, 4-E8) N(2)

Upgrading of waxy distillates and raffinates comprises:
 (i) hydrotreating waxy distillate or raffinate feed (A)
 under mild conditions so as to reduce S and N content, but
 converting less than 20% of (A) to products with lower b.pt.
 than (A);
 (ii) isomerising product of (i) in presence of H₂ over
 catalyst contg. less than 2 wt.% F;
 (iii) dewaxing isomerate to a pour point of 0°C and less.
 The isomerised product may be hydrogenated at low temp.
 before or after dewaxing.

USE/ADVANTAGE

For treating oils with wax content of as little as 10%
 but pref. 30-70% (claimed), e.g. distillates boiling in lube
 oil range, e.g. 300-700°C. Upgrading achieves high yields of
 lube oil of increased viscosity by converting wax into oil.
 Wax would otherwise overload wax recovery apparatus in sol-

vent dewaxing or, if catalytically dewaxed, result in loss in
 lube oil yield due to conversion of feed to gaseous or light liq.
 products.

PREFERRED METHOD

(ii) is carried out at 300-400°C, 500-5000 psig, H₂
 treat rate = 500-10,000 SCF H₂/bbl and LHSV = 0.5-5 v/v.hr.
 Isomerisation catalyst is gp. VIII metal with more than
 0.1 wt.% F (pref. 0.1-1.5 wt.%) on Al₂O₃-contg. refractory
 support. Pref. catalyst particle size of less than 1/16 inch,
 pref. catalyst is 1/20 inch Al₂O₃ trilobes.

EXAMPLE

(1) A South Louisiana raffinate (10.4 wt.% wax, V.I. =
 88, N = 140 ppm, S = 0-33 wt.5) having the following GCD
 fractions; ibp/l (all in deg.C) = 332/359, 5/10=426/451,
 20/30=476/492, 40/50=504/516, 60/70=527/539, 80/90=553/570, 95/
 fbp=585/614; and contg. 15.6 wt.% saturates and 27.4 wt.%
 aromatics was hydrotreated using a NiW/Al₂O₃ catalyst
 (6 wt.% F) at 350°C. Feed rate = 0.5 v/v/hr., gas rate
 SCF/B = 3000, 600 psig H₂. This reduced S and N to less
 than 1 ppm each while converting less than 20 of feed to

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products with a lower b.pt. than the feed. Resulting oil had a wax content = 13 wt.% and V.I.) 95.5.

(2) A catalyst, contg. 0.4 wt.% F, derived from a fluoridated reforming grade catalyst originally contg. 1% Cl⁻ and 0.3% Pt on 1/16" Al₂O₃, was used to isomerise the product of (1) under the following conditions; 361°C, feed rate = 0.9 v/v/hr. H₂ rate = 5000 SCF/b, 1000 psi H₂. The product contained 9.7 wt.% wax.

(3) After dewaxing, the product had a V.I. = 1-6.5, compared with 95.5 for an unisomerised sample of the hydro-treated feed, and represented a 90.8% yield of 370°C+ oils when compared with the unisomerised feed. (11pp2116HPDwg No0/0).

(E) ISR: US4518485.