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H04

COAS-08.12.88

COASTAL EAGLE POINT

*US 4935-120-A

08.12.88-US-282359 (19.06.90) C10g-65/10

Multistage hydrodewaxing process - using zeolite catalyst with heating of first stage effluent e.g. by adding hot hydrogen

C90-090351

H(4-A7, 4-A10, 4-B3, 4-D) N(6-A)

USES/ADVANTAGE

The feed may be a gas oil, lube stock, kerosene, whole or synthetic crude or tar sands or shale oil. It is esp. gas oil or vacuum gas oil, pref. slightly heavier than the desired product, and somewhat heavier than the feed to a conventional process using a shape-selective dewaxing catalyst to produce a fuel oil, as conditions are rather more severe; high octane gasoline is obtained as byproduct in enhanced amt. Higher conversions to lighter products are obtained, and for a longer time.

PREFERRED CONDITIONS

The endothermic reaction in the first stage causes a drop in temp. of at least 10°C and the first stage effluent is reheated by at least 5°C.

The feed comprises paraffinic gas oil and vacuum gas oil boiling range hydrocarbons and has a pour point above 75 (85)°F.

EMBODIMENT

A combined feed (4) consisting of heavy atmos. gas oil, light vacuum gas oil and FCC intermediate cycle oil, is mixed

In a catalytic hydrodewaxing process, a wax-contg. feed is contacted with hydrogen and a catalyst comprising a shape-selective crystalline zeolite of silica/alumina mole ratio at least 12, at reactor inlet temp. above 300°C, 100 - 3000 psig, LHSV 0.2 - 10, hydrogen/hydrocarbon mole ratio more than 0 up to 20.

The method is improved by conducting the process in at least two stages. The inlet temp. to the first stage is over 360°C, and the partially dewaxed first stage effluent is at less than the inlet temp.; this effluent is heated by at least 3°C and charged to the second stage, to produce a dewaxed hydrocarbon prod.

The process also converts at least 20 - 45 wt. % of the feed to lighter boiling components including gasoline range hydrocarbons having a research clear octane number of at least 12.

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with hydrogen-rich recycled gas (22) and make-up hydrogen (2) heated and passed to first stage reactor (10); as the reactions in this reactor are endothermic, the effluent (12) from the reactor is cooler, usually by at least 10°C, than the feed. The effluent is heated, pref. by at least 5°C, by adding hot hydrogen (heated at 16) from line (13), and passed to second stage reactor (15). The prod. therefrom (19) comprising dewaxed heavy feed, cracked products and hydrogen, is heat exchanged with feed, and passed to a separation system as shown.

The zeolite is e.g. ZSM-5 (pref), -11, -12, -23, -35, -38 or -48. (9pp1644CGDwgNo1/2).

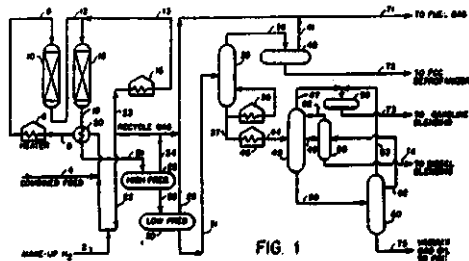


FIG. 1