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Conversion of lower olefin(s) to higher hydrocarbon(s) - by oligomerisation over acid zeolite catalyst with hydrogen present to inhibit coke formation due to oxygenate conversion

H(4-D1) 161

C85-113998 A continuous process for converting a feedstock of lower olefins contg. a minor amt. of oxygenated hydrocarbons to higher hydrocarbons including distillate product comprises contacting the feedstock with 1-50 mole % H_2 over a shape-selective medium pore acid zeolite oligomerisation catalyst under pressure and at elevated temp. up to about 325°C.

The conversion is pref. followed by
(a) reducing pressure on the reactor effluent stream to flash volatile components into a vapour phase and recovering a heavy liq. stream,
(b) cooling the vapour phase under pressure to recover a liquid intermediate olefin stream and condensed water (by--prod. of reaction),
(c) fractionating the heavy liq. stream to form a distillate prod. stream, and
(d) diluting olefinic feedstock with a major fraction of the intermediate olefin stream from (b), under pressure.

USE/ADVANTAGE

The technique inhibits coke deposition during the process. In particular, the additional steps (a)-(d) prolong catalyst life by inhibiting coke formation due to oxygenate conversion. The process is useful for producing distillate fuel, and the rate and compsn. of the recycle can be adjusted to change the boiling range and properties of the product.

CLAIMED EMBODIMENT

In the conversion of synthol olefinic liquid product of Fischer-Tropsch synthesis, the product is mixed with 1-50 mol % H_2 and contacted under pressure at 230-325°C with a zeolite oligomerisation catalyst, pref. HZSM-5, to form a distillate product, pref. essentially 154°C + aliphatic hydrocarbon comprising mainly 10-20C aliphatics, and light hydrocarbon vapour contg. H_2 and by-product water.

PREFERRED CATALYST

The catalyst is an aluminosilicate zeolite with constraint index 1-12 and $SiO_2:Al_2O_3$ ratio of at least 12. It should be free of hydrogenating components. A ZSM-5 zeolite is

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particularly preferred, with acid cracking value of at least 120.

PREFERRED CONDITIONS

The H_2 partial pressure is up to 50 psi for a process pressure of up to 800 psig, and is varied according to the amount of oxygenate in the feed.(8pp909RBIIDwgNo.0/1).