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Aromatics-rich hydrocarbon prepn. from synthesis gas - using physical catalyst mixt. contg. supported palladium catalyst and zeolite catalyst

C83-033980

Prepn. of aromatics-rich hydrocarbon mixt. is effected by contacting synthesis gas ($CO + H_2$) with a catalyst consisting of a physical admixture of (I) particles of a supported Pd catalyst (I) and (2) particles of a zeolite catalyst (II) capable of converting MeOH to gasoline-boiling range liquid hydrocarbons free of O cpds.

USE/ADVANTAGE

A high proportion of higher aromatic 10-12C hydrocarbons, esp. polymethylbenzenes, is produced selectively. The formation of O-conig. cpds. is suppressed. Catalyst activity remains unchanged for a long time, even when changes in the (I)/(II) weight ratio occur.

DETAILS

(I) pref. contains 1-10 wt.% Pd on a neutral or weakly alkaline support, e.g. SiO_2, Al_2O_3, MgO, CaO, La_2O_3 or ZrO_2, pref. SiO_2. (II) pref. has pore dias. of 5-10 Å and a $SiO_2 : Al_2O_3$ molar ratio of at least 12. The (I) : (II) weight ratio is 0.1:1 to 10:1 (esp. 1:0.25 to 1:4).

The H_2:CO mol ratio may be 0.5-2:1 and the reaction conditions are suitably 250-450 (pref. 300-400)°C and 5-100 (pref. 10-100) atm. The catalyst may be used as a fixed or fluidised bed.

E(10-J2B3) H(4-D, 4-E5, 4-F2E) N(2-F2, 6-A)

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EXAMPLE

A 2:1 mixt. of H_2 and CO was passed at 355°C and 20 atm. over a catalyst (A) comprising equal weight of Pd-on-silica (contg. 4 wt.% Pd) and ZSM-5. A control (B) was prepd. using Cu-Zn in the place of the Pd/SiO_2 in the mixt. Test results were (control in brackets) : hydrocarbon yield 11 (11) wt.%, O-contg. cpds. yield trace (0.6%); 9-12 C aromatics content in hydrocarbons 35.7 (3.9)%. (20pp200).

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