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Fischer-Tropsch catalysts based on zeolite - ion-exchanged with transition metal and reduced with metal vapour

D/S: E(AT BE CH DE FR GB IT LI LU NL SE).

New Fischer-Tropsch catalysts are prepd. by subjecting a zeolite (I) to ion exchange with at least one reducible metal salt (II) and reducing with the vapour of at least one reductant metal (III). Specifically, (I) is a particulate synthetic zeolite which has a pore size of 2-10 Angstroms and has ion exchange properties, (II) is a salt of a transition metal capable of catalysing the conversion of CO and H<sub>2</sub> to hydrocarbons, and (III) is a metal with a redn. potential greater than that of the transition metal at a temp. below 800 deg. C.

#### USES/ADVANTAGES

Depending on the choice of (I), (II) and (III), catalysts can be prepd. with very high selectivity for either propylene or 4-6C hydrocarbon prodn.

#### DETAILS

A, 1-D13) E(10-J2C3, 10-J2D, 31-P2)H(4-E5, 4-F2E) N(6-B).

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The catalysts are pref. prepd. by (a) contacting (I) with a soln. of (II), (b) drying to remove water from the zeolite pores, (c) reducing with vapour of (III), (d) heating to remove excess (III), and (e) cooling to below 200 deg. C under vacuum or in an inert atmos.

For propylene prodn., (I) is pref. zeolite A, (II) is a Co salt and (III) is Cd. For 4-6C hydrocarbon prodn., (I) is pref. zeolite Y, (II) is a Co salt and (III) is Cd. Fischer-Tropsch synthesis is pref. effected by contacting a mixt. of H<sub>2</sub> and CO with the catalyst at a temp. below 400 deg. C and a pressure above 1 atm.

#### EXAMPLE

Ion exchange was effected by contacting 10g of CaA zeolite (60-80 mesh) with 100 ml of 0.1N CoCl<sub>2</sub>.6H<sub>2</sub>O at 95 deg. C for 2 hr. and repeating this operation 5 times more using fresh soln. each time, followed by washing and drying.

The product was evacuated down to 0.001 torr, heated at 470 deg. C for 11 hr., mixed with 0.5g Cd powder, heated at 460 deg. C for 16 hr. and at 490-500 deg. C for 42 hr., and cooled to room temp. (all in vacuo). The product was heated at 460-500 deg. C and 0.01 torr for 16 hr. to obtain a Co/CdA zeolite catalyst.(26pp367).

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