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Aromatic hydrocarbon prodn. from carbon mon:oxide and hydrogen - using a catalyst mixt. of an acyclic oxygen contg. hydrocarbon prodn. catalyst and a crystalline gallium silicate

Aromatic hydrocarbon mixts. are prepd. from synthesis gas (CO + H2) using a mixt. of two catalysts. One catalyst (X) is capable of converting the H2/CO mixt. into acylic oxygen-contg. hydrocarbons, while the other (Y) is a crystalline gallium silicate having (a) a characteristic X-ray powder diffraction diagram (radiation Cu-K alpha 2 theta/relative intensity, wavelength 0.15418 nm; where ZS= very strong; S = strong; M = medium; Z = weak; theta = Bragg angle) 7.8-8.2, S; 8.7-9.1, M; 11.8-12.1, Z; 12.4-12.7, Z; 14.6-14.9, Z; 15.4-15.7, Z; 15.8-16.1, Z; 17.6-17.9, Z; 19.2-19.5, Z; 20.2-20.6, Z; 20.7-21.1, Z; 23.1-23.4, ZS; 23.8-24.1, ZS; 24.2-24.8, S; 29.7-30.1, M., and (b) a formula, expressed as the oxides (omitting those of H and alkali(ne earth) metals), in which the Ga2O3/SiO2 mol. ratio is less than 0.1.

Component (X) is pref. a Zn/Cr catalyst in which the atomic percentage Zn/Zn+Cr is at least 60 (pref. 60-80)%. The catalysts pref. contain 1-5 pts. vol. (X) per pt. vol. (Y).

ADVANTAGE

The catalysts have high activity and high selectivity.

DETAILS

The H2/CO mixt. pref. has a mol. ratio of 0.25-1.0. Conversion is pref. carried out at 200-500 (esp. 300-450) deg.C, 1-150 (esp. 5-100) bars, and a GHSV of 300-3000.

EXAMPLE

Crystalline silicates were prepd. from mixts. of SiO2, NaOH, ((C3H7)3N)OH and Ga(NO3)3 in water, heated in an autoclave for 24 hours at 150 deg.C. The prods. were filtered off, washed, dried and calcined at 500 deg.C. A typical prod. had a Ga2O3/SiO2 ratio of 0.0185. This was boiled with 1 M NH4OH, dried and calcined at 500 deg.C again, then 1 pt. of the silicate was mixed with 10 pts. of a ZnO-Cr2O3 catalyst contg. 70 atom% Zn.

The catalyst was used for conversion of a H2/CO mixt. having a H2/CO mol. ratio of 0.5, at 375 deg.C, 60 bars and a GHSV of 1000. After 10 hours' operation, the conversion was 67% with a selectivity of C5+ material of 77%. Over 50% of the C5+ fraction was aromatic.(15pp513).

E(10-J2B3) H(4-E1, 4-E5, 4-F2E) J(4-E1, 4-E4) N(1-D, 3-D, 3-F)

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of 50 deg.C. After 15 mins the foam was removed from the mould and treated in a forced air circulation oven for 2 hrs. at a wet bulb temp. of 55 deg.C. and a dry bulb temp. of 65 deg.C. A rigid foam with a smooth surface and uniform cell structure throughout was obtd. The prod. had a compressive strength of 207 kPa at 23 deg.C/50% R.H. (29pp513).