88-001272/01 E19 H06 SHEL 02.07.86
SHELL INT RES MIJ BV *EP -251-358-A
02.07.86-GB-016161 *(07.01.88)* B01j-29/36 C07c-01/04

Catalyst for converting synthesis gas to hydrocarbon(s) - comprises GP/IIB and GP/VIB metals and a trivalent metal silicate prepd. in specified manner

C88-000543 R(BE DE FR GB IT NL)

A catalyst compsn. (I) contains
(a) at least one Group IIb metal or related cpd.;
(b) at least one Group VIb metal or related cpd.; and
(c) a crystalline trivalent metal silicate (II).
(II) is obtainable by maintaining an aq. alkaline mixt. (III) at an elevated temp. until (II) is formed, and separating the latter.
(III) comprises silicon cpd(s), trivalent metal cpd(s) (A), cpd(s) (MX) of metal(s) (M) of Group Ia, and organic nitrogen cpds., in molar ratio: RN:R_4NY = 1-1000; SiO_2-R_4NY= 10-5000; SiO_2:Al_2O_3 = 50-300; SiO_2:MX = less than 15; H_2O:SiO_2 = 5-100. RN is a pyridine and R_4NY an organic quat. ammonium cpd.

Hydrocarbons are prepd. by contacting synthesis gas with catalyst (I).

E(10-J2D) H(4-E5, 4-F2, 4-F2E) N(1-A, 1-B, 1-C, 5-D, 6-B)

USE/ADVANTAGE

Hydrocarbons have been obtd. from synthesis gas using as catalyst Zn and Cr in combination with a crystalline aluminium silicate; a considerable quantity of durene is however produced, and this is undesirable when the object is to produce gasoline. Present catalyst yields less durene, and may have increased life time.

PREFERRED CATALYST

(a) is Zn, and (b) is Cr, present as their oxides; wt. ratio (a+b) : (c) is 0.2-7. Further metals may be present e.g. Cs, Ca, Mg, Ti and esp. 1-5 wt.% Mn. The trivalent metal in (II) is Al; Fe and/or Ga may be present.
A suitable starting mixture for the prepn. comprises amorphous silica, aluminium sulphate, sodium hydroxide, sodium sulphate, pyridine, water and either tetrapropyl ammonium hydroxide or tetraethyl ammonium bromide; the mixture is held at 100-250°C for 30-120 hr., the crystals formed separated, dried and calcined at 300-500°C. The product has a characteristic X-ray diffraction pattern.

PROCESS CONDITIONS

Synthesis gas conversion takes place pref. at 300-450°C, 5-100 bar, space velocity 200- 3000 litre gas/kg catalyst/hr., H_2/CO molar ratio 0.4-2.

EXAMPLE

Synthesis gas was contacted at 375°C, 60 bar, space velocity 850, with a catalyst according to the invention. The durene content of the normally liq. product was 1.5%. Using a prior art Zn/Cr aluminium silicate catalyst the durene content was 4.0%.(9pp1644CGDwgNo.0/0).

(E) ISR:- No Search Report

EP-251358-A