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RES ASSOC PETROL AL *EP -110-357-A
29.12.82-JP-229834 (+JP-207662) (13.06.84) B01j-23/78 C07c-29/15 C07c-31/04

Prodn. of mixt. of alcohol cpds. from synthesis gas - useful as gasoline component, using 4-component catalyst at moderate pressure

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E(10-E4E, 33-A, 34-B, 34-C2, 35) H(4-D, 4-F2D) J(4-E1) N(1-A, 1-B, 1- C2, 2, 3)

CLAIMED CATALYST PREPARATION AND USE

A mixt. of methanol and higher alcohols is obtd. using a catalyst prepd. by:

(i) calcining a mixt. of a Cu cpd. (A_1), a Ni cpd. (B_1) and a cpd. (C) of at least one metal from Gps. II, III, and IV and the 4th Period of Gps. V, VI and VIII;

(ii) impreg nating the prod. with a cpd. (D) of an alkali or alkaline earth metal;

(iii) calcining the mixt.; and

(iv) reducing the prod.

Alternatively in step (i), t he Cu cpd. (A_1) may be replaced by a Zn cpd. (A_2), while the Ni cpd. (B_1) is replaced by a cpd. (B_2), of at least one of Fe, Co and Ni.

USE/ADVANTAGE

The mixt. is useful as a gasoline component. Selectivity to alcohols from CO and concn. of higher alcohols in the mixt. are both high (e.g. 52% and 47% respectively), the latter aiding compounding with gasoline. Operating pressure can be moderate (e.g. 50 kg/cm^2.

PREPARATION

(C) is pref. a cpd. of Mg, Sn, (except with (A_2)), Al, Ga, La, Si, Ti, Zr, Cr or Mn. In step (i), a mixed aq. soln. can first be prepd. of sol. salts (e.g. nitrate, chloride, or sulphate) cor responding to cpds. (A), (B) and (C). The mixt. can then be co-precipitated, e.g. with Na_2CO_3 or NaOH soln., and the ppte. aged if necessary, washed, dried and calcined. In step (ii), cpd. (D) is pref. used in aq. soln.

It is pref. a Na or Mg cpd. if cpds. (A_1) and (B_2) have been used. Step (iii) is pref. effected at 100-500°C, and step (iv) at 200-400°C, using H_2 or CO.

MATERIALS

The molar proportions of catalyst components (calculated as oxides) are pref.; 0.05-0.7 (A), 0.01-0.7 (B), 0.01-0.7 (C), and 0.005-0.3 (D).

Reaction with synthesis gas (CO/H_2 = 3:1 to 1:3 molar) is pref. at 240-450°C, 40-100 kg/cm^2 (g) and CHSV 1,000-50,000.

EXAMPLE

A catalyst of molar compsn. 0.36 Cu, 0.18 Ni, 0.36 Si, 0.10 Na was prepd. according to the invention. It was used with a mixt. of CO and H_2 (1:2 molar) at GHSV 4,000, 50 kg/cm^2 (g) and 312°C. There was 21% conversion of CO, and 52% selectivity to alcohols. The alcohol mixt. produced comprised (wt.%): 53 MeOH, 28 EtOH, 11 $C3H_7OH$ and 8 $C4H_9OH$ and higher. (38pp1492MHDwgNo0/0).

(E) ISR: No Search Report.