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Attrition-resistant sulphide catalyst for converting synthesis gas - to alcohol(s) and hydrocarbon(s) prepd. by thermal decomposition of precursor, pref. ammonium thio molybdate, as particles of centric shape C87-036533 E(BE DE FR GB IT NL)

Prod'n. of 1-10C aliphatic hydrocarbons or 1-10C mixed alcohols comprises reacting a gaseous mixt. contg. H₂ and CO with a catalytic amt. of an unsupported catalytic sulphide which is characterised in that it is attrition-resistant, contains Nb, Ta, Mo, W, Tc or Re, and is prepd. by precipitating a centric particulate precursor and then thermally decomposing it. (Centric here means having mass conc. about a centre).

USE/ADVANTAGE

The catalyst is pref. useful for prodn. of 1-5C (esp. 2-5C) mixed alcohols, CH₄, and 2-5C alkanes. The attrition loss in 30 days measured under specified conditions is pref. less than 33%; this is less than the loss from similar catalysts prepd. by the prior art, which are non-centric, particulate. The catalytic activity as defined by Anderson et al. (Ind. Eng. Chem. 44 (2), 391-401 (1952)) is pref. at least

E(10-E4E, 10-J2D, 11-H, 33-F, 34-B4, 34-D3, 34-E, 35-C) H(4-E5, 4-F2E) N(1-A, 1-B, 2, 3)

100 million. 1-5C mixed alcohols are pref. produced in at least 70% CO₂ free carbon selectivity. Activity and selectivity are pref. largely retained after 4000 h.

PREFERRED CATALYST

The catalytic sulphide pref. also contains as metal promoter, free or combined, one or more of Fe, Ni, Co, La, Ce, Sm, Th, Na, K, Zn, Mg and Ca. The catalytic sulphide pref. contains Mo or W: more pref. it contains Mo, with Co and an alkali metal as promoters.

CATALYST PREPARATION

The catalyst is pref. prepd. by pptn. of (NH₄)₂MoS₂O₂ as precursor from an aq. soln. at 12-18C, and then thermally decomposing in N₂ at 400-700°C for 0.5-2 h.

PROCESS

The catalyst is pref. used in a fluidised bed reactor.

EXAMPLE

16g ammonium paramolybdate was dissolved in 85ml H₂O and 15ml conc. NH₄OH. The mixed soln. was stirred at 15°C while adding 65g 22% (NH₄)₂S over 1 h. The slurry was filtered, and the crystals dried. The crystals had centric

EP-216472-A+

shape and particle size 25-200 μ . They were converted to an unsupported catalytic sulphide for fluidised bed use by heating in a N₂ stream at 500°C for 1 hr.

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