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 EXXON RES & ENG CO *EP--38-171
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 Catalytic hydro-liquefaction of coal - using phenolic carrier for catalyst precursor

E(10-E2E, 10-J2D) H(9-A1) N(1, 2, 3)

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DETAILS

The catalyst precursor may be an inorganic poly acid (esp. phosphomolybdic acid), a metal carbonyl, a metal halide or a metal salt of an organic acid. The precursor is pref. used in an amt. corresp. to 1-2000 ppm of metal based on the wt. of coal. The liq. medium can comprise neat phenols or a phenol/hydrocarbon mixt.

The diluent is pref. a hydrocarbon, esp. a bottoms fraction derived from coal liquefaction. Hydroliquefaction is pref. effected at 200-538 °C using an H₂-contg. gas opt. contg. 5-50 mole % CO or 1-10 mole % H₂S.

EXAMPLE

An autoclave was charged with 46 g dry Wyodak coal (200 mesh), 46 g 1-methylnaphthalene and a 4% phosphomolybdic acid soln. in m-cresol (102 ppm Mo based on coal wt.). The mixt. was reacted at 820°F under 2245 psia H₂ and 250 psia H₂S for 30 min. and then at 820°F under 1815 psia H₂ for 60 min. The liq. yield was 83.11% (cf. 75.83% using 4% aq. phosphomolybdic acid). (25pp367). (E)ISR: No Citns.

D/S: E(DE FR GB)

Hydroliquefaction of coal is carried out by reacting a mixt. of coal, diluent and catalyst with an H₂-contg. gas and recovering liq. hydrocarbon products. The catalyst is formed in situ from a precursor comprising a cpd. contg. one or more Group II, III, IVB, VB, VIB, VIIB and/or VIII metals.

The catalyst precursor is added to the diluent in the form of a soln. in a liq. medium contg. at least 30 (pref. at least 50) wt. % of one or more phenols, the soln. contg. not more than 50 wt. % of the precursor.

ADVANTAGES

Use of phenols as carriers for the catalyst precursor gives greatly increased liq. yields compared with the use of water or hydrocarbon carriers contg. less than 30% phenols.

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