50053C/29   H09   HYDS 22.12.78

HYDROCARBON RES INC   *DT 2945-947

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Prodn. of fuel gas by liq.-phase hydrogenation of coal - using hydrogen from steam-reforming of liq. prods.

A process for the prodn. of a fuel gas (consisting mainly of 1-3C hydrocarbons) by the non-catalytic hydrogenation of coal has the following characteristic features: (a) the coal is suspended in a heavy hydrocarbon obtd. in the process and the slurry is passed to the reaction zone; (b) H_2 is passed into the reaction zone; (c) the zone is maintained at 449-493°C and 699-2005 N/cm^2 H_2 partial pressure; (d) a coal feed rate of 80-800 kg/h per m^3 reactor volume is maintained; (e) gas and liquid streams are drawn off from the reaction zone; (f) a C_4 naphtha fraction is sepd.; (g) a major part of the C_4 fraction is passed to a catalytic steam reformer to produce H_2 for use in step (b); (h) a major part of the liq. stream from step (e) is used as fuel to heat the steam reformer to 806-954°C; and (i) the fuel gas product, in an amt. of 14-40 wt.% (based on the coal), is separated from the gas stream in step (f).

ADVANTAGES

Producing the H_2 required within the process gives sub-

H(9-A1, 9-C).

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stantial economic advantages. The process is flexible and can be varied to match the seasonal fluctuation in demand for heating gas by changing the conditions to vary the ratio of gas and liquid products.

PREFERRED PROCESS

The liquid stream from (e) is split into a C_4 naphtha fraction, a 204-316°C distillate fraction and a residual fraction boiling at over 316°C.

The gas stream from (e) is split into a C_4 naphtha fraction, H_2 of medium purity and a fuel gas product.

A mixt. of H_2 and CH_4 produced in (g) is recycled to (b). The residual fraction from (f), after partial removal of solids, is used in (a) to suspend the coal. Distillate surplus to that required for heating the reformer is drawn off as product.(31pp195).

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