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GULF RESEARCH &amp; DEV CO

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Combined coal liquefaction-gasification process - giving high yield of 450-850 degrees Fahrenheit distillate liq. and with reduced hydrogen consumption

H(9-A1, 9-C).

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the gasifier feed to produce synthesis gas; and (e) converting at least a portion of the synthesis gas to a H<sub>2</sub>-rich stream and passing it to (I).

ADVANTAGE

High selectivity in favour of 450-850°F boiling distillate liquids is achieved. Hydrogen consumption is reduced.

DETAILS

Pref. the net yield of 450-850°F liq. is  $\geq 50$  (esp.  $\geq 80$ ) wt.% greater than that of  $> 850^\circ\text{F}$  solid dissolved coal.

The zone (I) comprises a preheater and a dissolver and the residence time in the dissolver is pref.  $< 1$  (esp.  $< 0.5$ ) hr. The amt. of hydrocarbonaceous material passed to the gasifier is pref. sufficient to produce excess synthesis gas (esp. enough excess to provide (on burning) 5-100% of the total energy requirement of the process).

Step (c) is carried out by vacuum distillation. (33pp959).  
(E) ISR: DT2822487; US3477941; DT2327353;  
US4050908; US3617465; FR1424090; FR2297239;  
DT2728537.

D/S: E(DT, FR, GB, NL).

A combined coal liquefaction-gasification process comprises (a) passing to a coal liquefaction zone (I) a mineral-contg. feed coal, H<sub>2</sub>, recycle dissolved coal (which is solid at room temp.) and recycle mineral residue, in order to dissolve hydrocarbonaceous material from the mineral residue and hydrocrack it to produce an effluent comprising hydrocarbon gases, dissolved liquid coal, solid dissolved coal and suspended mineral residue; (b) recycling to (I) a portion of the dissolved liquid coal, solid dissolved coal and suspended mineral residue, the ratio of recycle to feed coal being such that the net yield after recycle (based on dry feed coal), of solid dissolved coal is  $\leq 17.5$  wt.% and the net yield after recycle of 450-850°F dissolved liq. coal is  $\geq 35\%$  greater than that of solid dissolved coal; (c) sepg. solid dissolved coal and hydrocarbon gases from solid dissolved coal and mineral residue to produce a gasifier feed slurry; (d) gasifying