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GULF OIL CORP

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Combined coal liquefaction-gasification process - with excess synthesis gas generated in the gasification step

H(9-A1, 9-C).

ADVANTAGES

The shifting of some of the processing load to the gasification zone unexpectedly increases the thermal efficiency of the process.

DETAILS

The additional synthesis gas may be burned as such, without CO-H<sub>2</sub> separation, as a fuel in the process, or part may be converted to other fuels, such as methane or methanol.

The total coke yield of the liquefaction is <1 wt% (based on the feed coal).

The H<sub>2</sub>-CO separation step may be cryogenic or adsorption methods. (16pp920).

A process is claimed for the combined liquefaction/gasification of coal with a process feed comprising a mixt. of coal, H<sub>2</sub>, recycle liquid solvent, recycle dissolved coal and recycle mineral residue, and with the gasification zone being operated at a max. temp of 2200-3600 (esp. 2400-3200)°F. The improvement comprises controlling this zone and partic. the amt. of hydrocarbonaceous material passed to it, so as to produce synthesis gas in excess amts. beyond that required for process H<sub>2</sub>.

Specifically, the synthesis gas has an H<sub>2</sub>:CO mole ratio is <1 (pref. <0.9, esp. <0.8) and is separated to produce a first, H<sub>2</sub>-rich stream for use in the liquefaction zone as process H<sub>2</sub>, and additional amts. to the extent of 5-100% on a heat basis of the total energy requirements of the process. The amt. of dissolved coal in the gasifier feed slurry is controlled at 15-45 (pref. 15-30, esp. 17-27) wt. % of the feed coal. Of the additional synthesis gas, pref. > 60 (esp. > 70) mole % is burned as fuel in the process.

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