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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

A process is claimed for the combined liquefaction/gasification of coal with the process feed comprising a mixt. of coal, H₂, recycle liquid solvent, recycle dissolved coal and recycle mineral residue. The improvement comprises controlling the gasification step, and partic. the amt. of hydrocarbonaceous material passed to it, so as to produce an amt. of synthesis gas in excess of the H₂ requirements of the process.

Specifically, the combustion heating value of the excess amt. of synthesis gas is 5-100% (on a heat basis) of the total energy requirements of the process; the excess synthesis gas is burned as fuel in the process.

ADVANTAGES

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

DETAILS

The total coke yield in the liquefaction zone is < 1 wt.%

H(9-A1, 9-C).

(based on the feed coal).

The gasification zone is operated with a max. temp. of 2200-3600 (pref. 2300-3200) °F, and 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.

In an alternative embodiment, ≥ 60 (pref. ≥ 70, esp. ≥ 80) mole % of the CO + H₂ content of the additional synthesis gas is burned as a fuel, the remainder being converted to another fuel, esp. methane or methanol.

The H₂ : CO mole ratio of the synthesis gas produced is < 1 (pref. < 0.8).(16pp920).

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