

## DERWENT PUBLICATIONS LTD.

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 GULF OIL CORP \*WP 8001-281  
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 Integrated coal liquefaction-gasification-naphtha reforming - with  
 part of the naphtha by-passed to serve as fuel for the process

H(9-A1, 9-C) N(6).

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Process control with regard to (I) : (II) ratio and the amt. of excess synthesis gas produced in the gasification zone is effected such that thermal efficiency loss is inhibited, more specifically kept within 2 (pref. within 1)%

ADVANTAGES

No mineral residue sepn. or drying, no normally solid dissolved coal cooling or handling and delayed or fluid coking steps are required.

DETAILS

(I) pref. comprises 60-90 wt.% and (II) 10-40 wt.% of the total naphtha yield. The total combustion heat of the excess synthesis gas (or CO fraction) is  $\geq 5$  (pref.  $\geq 50$ )% on a heat basis of the total energy requirements of the process.

The liquefaction involves an endothermic preheating step and an exothermic dissolving step, the latter being effected at about 840-870°F and an H<sub>2</sub> pressure of 1500-2500 psi to effect hydrogenation and hydrocracking. The gasifier is pref. operated at 2500-3200°F.

D/S: N(BR, JA, SU)+E(DT, FR, GB, NL).

An integrated coal liquefaction/gasification/naphtha reforming process is claimed, characterised in that the residual slurry from the liquefaction zone product separation system, comprising normally solid dissolved coal and mineral residue, is utilised as the sole carbonaceous feed for the gasification zone which produces synthesis gas some of which is converted to an H<sub>2</sub>-rich stream which is recycled and used to cover part of the process H<sub>2</sub> requirements. The amt. of synthesis gas produced in a gasification zone is in excess of the process H<sub>2</sub> requirements; the excess (or a CO fraction of it) is burned to contribute fuel values to the process. The naphtha fraction obtained from the liquefaction zone effluent is split into two streams, the first (I) being passed through the reformer and the second (II) being used as a fuel in the process. (I) comprises 30-95 wt.% and (II) 5-70 wt.% of the total naphtha yield.

WP8001281+

The naphtha (generally  $C_5$  to  $380^\circ F$ ) will constitute 4-20 (pref. 5-15) wt.% of the feed coal on a dry basis and the reforming (following preheating, hydropretreatment and second preheating) will generally be operated with a Pt or Pd on alumina catalyst at  $800-975^\circ F$  and an  $H_2$  pressure of 100-800 psi. The reformer  $H_2$  yield is recycled. (47pp920).

(E) ISR: US4075079; US4039424; US3700586; US3518182; US3071536; 1 Journal reference.