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 Coal liquefaction process with slurry recycle - using more than one
 feed coal for particle size control

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

B2

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

A coal liquefaction process, opt. for incorporation in an integrated liquefaction/gasification system, is claimed, with the improvement relating to the control of the solids concn. in the recycle slurry, e.g. when processing high-ash feed coals, by diluting the slurry with a recycle stream contg. suspended mineral particles of relatively low median dia.

Specifically, ≥ 2 different feed coals are employed, the first, comprising ≥ 5 (pref. ≥ 10 , esp. ≥ 20) wt.% of the total, generating upon dissolution particles of mineral residue having a smaller median dia. than those generated by the other(s). In the process, the liquefaction zone effluent is passed to a vapour-liquid separator where H_2 , hydrocarbon gases and naphtha are removed overhead. The residue slurry is split into three streams, the first (A) being recycled to the feed coal mixing vessel, the

second (B) being passed to a product separator, and the third (C) to a hydrocyclone. The hydrocyclone provides an overflow slurry (I), comprising liquid coal, normally solid dissolved coal with relatively small particles of suspended mineral residue, and an underflow slurry (II) of similar compns. as (I) but with larger particles. (I) is recycled to the liquefaction zone to selectively increase the proportion of smaller particles there; (II) is passed to the product separator.

ADVANTAGES

The dilution effected by addition of (I) to the recycle reduces the amt. of recycled solids while maintaining an adequate catalytic activity or enhances the catalytic activity for a given solids level.

DETAILS

The residue slurry contains 5-40 wt.% solids, and (C) comprises 10-75 wt.% of the total residue slurry. (I) contains 0.2-20 wt.% solids with a median dia. of 0.5-5 μ .

When the liquefaction is operated without an integrated gasification step, a portion of the process slurry can be

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filtered to provide solids-free normally solid dissolved coal which can be recovered as product or recycled to extinction. (40pp920).

(E) ISR: US4102775; US4090943; US3962070; US3884796; US3540995; 4 Journal references.