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Coal liquefaction with recycle of solid bottoms - as fuel for preheating coal slurry in hybrid boiler (ZA 27.5.81)

H(9-A1)

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EMBODIMENT

The coal slurry is mixed with  $H_2$  and preheated to 750-900 °F by passage through a preheat coil (19) in the convection section (20) of the hybrid boiler (21). The mixt. is then passed to a liquefaction reactor (29) operating at 750-900°F and 1500-3000 psig. The effluent is fractionated (31) by atmospheric and vacuum distn. to produce various fractions, including a solvent fraction and a bottoms fraction.

Part of the bottoms fraction (46) is burned in the combustion section (22) of the boiler, and the rest is gasified to generate  $H_2$  for hydrogenating (37) the solvent fraction. Steam is generated in a steam coil (54) located in the radiant section (51) of the boiler. This steam can be used as process steam and/or for generating electricity in a turbo generator (57).(10pp367).

Liquefaction of coal (or other solid carbonaceous material) is carried out by (a) slurrying the coal in a solvent or diluent, (b) preheating the slurry in the convection section of a hybrid boiler, (c) subjecting the slurry to liquefaction conditions to produce a gaseous product, a liq. product and a normally solid bottoms product, and (d) burning at least part of the bottoms product as a liq. or solid in the combustion section of the hybrid boiler.

ADVANTAGES

Using the bottoms stream as fuel to preheat the slurry directly (rather than via steam generation) improves the thermal efficiency of the process.

DETAILS

Liquefaction conditions are pref. controlled to produce a bottoms product contg. 60-90 wt. % carbon, and at least 40% of the bottoms product is burned in the combustion section of the boiler.

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