

90-014906/02 E36 H04

EXXON RES & ENG CO

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Mfg. hydrogen and carbon monoxide as synthesis gas - by indirectly cooling prod. gas limiting formation of methane and cooler carbon deposits

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*US 4877-550-A

E(31-A1) H(4-E4) N(2-C1)

ADVANTAGES

The process preserves as H_2 and CO, the hydrocarbon conversion to synthesis gas in the reaction zone, whilst preventing carbon deposition in equipment lines during the cooling step as well as making more efficient use of the heat recovered in the cooling zone and to save energy by using that heat to preheat the light hydrocarbon feed to the reaction zone.

PREFERRED CONDITIONS

Cooling is effected at a rate of 400-900°F/s until the temp. of the prod. gas is less than about 1200°F. The temp. in the reaction zone is at least about 1750°F. At least 5% of the recovered steam is used for preheating the feed. The net conversion of feed to CO and H_2 is at least about 90%. The formation of carbon in the cooling zone is less than about 0.2 moles carbon per 100 moles CO and H_2 . (6pp1684CGDwgNo 0/2).

Process for the prodn. of H_2 and CO comprises:

- (i) reacting in a fluidised reaction zone a light hydrocarbon feed with steam and oxygen at elevated temps. in the presence of a catalyst contg Ni on a support;
- (ii) recovering from the reaction zone a prod. gas comprising H_2 , CO and entrained catalyst;
- (iii) cooling by indirect means with boiling water forming high pressure steam in a cooling zone, the prod. gas at a rate of at least about 300°F/s, thereby minimising the reaction of CO with H_2 to form CH_4 ;
- (iv) recovering high pressure steam from the cooling zone;
- (v) preheating the hydrocarbon feed with at least a portion of the steam recovered in step (iv); and
- (vi) maintaining a net conversion of feed to CO and H_2 of at least 80%.

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