

84-115719/19 H09 M24 FARH 27.10.82
 HOECHST AG (UHDE) *EP -107-131-A
 27.10.82-DE-239774 (02.05.84) C01b-25/02 C01b-31/32 C10j-
 03/08 C22b-13 C22c-33

Co-prodn. of synthesis gas and endothermic reaction prod. - of
 carbon pref. calcium carbide, ferrosilicon, iron or phosphorus

H(9-C) M(24-A5, 25-A1)

025

ADVANTAGE

Compared with prior art, the temp. in (I) is more widely variable and, since (I) is surrounded by feedstock, heat damage to appts. and heat loss are reduced. Gas distribution is more uniform.

DETAILS

The reactions are carried out in a cylindrical wet-bottom gas producer. Ash particles are filtered out of the synthesis gas as it flows upwards through zones (II) and (III). The bed material slowly falls under gravity, and is heated first in (III) and further in (II). Make-up material of particle size 10-60 mm are added through a sealed port above (III). The temp. in (I) is 2000-3300°C, unless addnl. steam and/or CO₂ is fed here, when the temp. reached can be 1300-2000°C.

To obtain various co-prods., the compsn. of the bed mixt. (zones (II) and (III)) and the reaction temp. (zone (II)) are as follows; for calcium carbide, lime and coke or anthracite at 1800-2300°C; for ferrosilicon, coke, scrap iron and opt. quartz at 1300-1800°C; for iron prodn.,

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C84-048655

D/S: DE GB IT.

Synthesis gas mfr. generates an endothermic co-prod. (pref. CaC₂, ferrosilicon, Fe or P) and requires a carbonaceous feedstock and uses the heat of the synthesis gas. An inlet stream of e.g. coal powder, O₂ and steam is blown into the base of a bed of co-prod. feedstock mixt. (e.g. CaO and coke for CaC₂ mfr.). This stream reacts at 1300-3300°C in a primary reaction zone (I), comprising a cavity or fluidised zone in the bed, to give synthesis gas. This passes into the redn. zone (II), above and around (I), where CO₂ and H₂O react with the coke at e.g. 2200°C to give more synthesis gas, and the co-prod. Gas reaches the vessel exit through a preheating zone (III) of the bed mixt. Molten prods. (e.g. CaC₂) and slag flow to the base of the bed and are tapped off at intervals.

coke and oxidic iron ore at 1300-1800°C; for phosphorus, coke, calcium phosphate and quartz at 1300-1700°C.
(31pp1492MHDwgNo0/5).
(G)ISR: No Search Report.

Full Patentees: Hoechst AG; Uhde GmbH.