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 HOECHST AG \*EP--72-457  
 18.08.81-DE-132506 (23.02.83) C01b-25/02 C01b-31/32 C10j-  
 03 08 C22b-13 C22c-33  
 Synthesis gas prodn. - coupled with endothermic redn., e.g. of  
 metal oxide, by carbon

H(9-C) L(2-B3)

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Reaction in the redn. zone, with coke as reductant in each case, can also be with (a) lime at 1800-2300°C, giving calcium carbide; (b) with calcium phosphate and quartz at 1300-1700°C, giving P; or (c) with oxidic Fe ore at 1300-1800°C, giving Fe. Effluent gas from the redn. zone is used to preheat its reactants.

EMBODIMENT

60 t/h fine coal dust (1) passed from bunkers (2) to burner nozzles (3), where it mixes with about 5,000 cu.m/h CO<sub>2</sub> (5) and 39,290 cu.m/h O<sub>2</sub> (4). Gasification occurs in the gasification zone (6a) at about 2000-2300°C, and the gas passes to the redn. zone (6b) which is at about 1600°C. This zone also receives 2.08 t/h coke and 2.09 t/h small scrap iron via a supply line (8) and a preheating zone (6c).

In the redn. zone (6b), ferrosilicon (45% Si) is produced at 4.2 t/h, and is removed as a melt (at 7a and 7b). The synthesis gas, enriched with CO and depleted in ash particles after reaction in the redn. zone, leaves the preheating zone (6c), opt. via a waste-heat boiler (10), for dust removal (11). 122,100 cu.m/h synthesis gas (12) is produced, and 4.2 t/h dust (14) contg. 57 wt. % Al<sub>2</sub>O<sub>3</sub>. The dust

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C83-019851 D/S: E(BE DE FR GB IT NL SE)

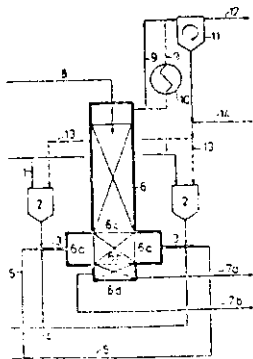
In the prodn. of synthesis gas from coal dust and O<sub>2</sub> with opt. H<sub>2</sub>O or CO<sub>2</sub>, the prod. gas at 2000-2500°C, in passing to an adjoining redn. zone, provides heat for the reaction between coke, another reactant and pref. the gas-borne ash (dust). E.g. in the redn. zone, coke, scrap iron and Si cpds. in the ash react to give ferrosilicon. The effluent gas is freed from any remaining dust before collection. Alternative reactants in the redn. zone can give calcium carbide, P or Fe.

ADVANTAGES

Ash is upgraded. The dust remaining in the gas is reduced by e.g. 50%, and, when collected, has improved hydraulic binder properties, owing to the increased concn. of Al<sub>2</sub>O<sub>3</sub>. The CO<sub>2</sub> content of the gas is minimised.

DETAILS

can be partly recirculated to gasification (via 13).  
(22pp1492).  
(C) ISR: No Search Report



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