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Process and appts. for synthesis gas prodn. - by catalytically reforming hydrocarbon with steam and heat exchange with combustion gas which is recycled to the combustor

C87-024285 E(AT BE CH DE FR GB IT NL)

E(31-A1) H(4-E4, 4-F2E) N(6-D)

fuel and oxygen are required, and the lower combustion temp. decreases formation of nitrogen oxides.

EMBODIMENT

Fuel (1) at super-atmospheric pressure, e.g. effluent gas from a hydrocarbon synthesis unit, and air (3,5, compressed by compressor 4) are fed to a combustor (2), and combustion gas therefrom (6) passed to a section (7) of the reactor where heat exchange with the catalytic reformer section (8) takes place. Heat exchanged combustion gas is then, after compression (at 15), recycled (e.g. at 650-800°C 10-12 bar) to (2).

Section (8) is fed with hydrocarbon and steam, and pref. also carbon dioxide, by line (9). Reaction product (10) is compressed if required by compressor (11); power for (11) is generated by passing part of the heat exchanged combustion gas to turbo-expander (13). Excess power from the turbo-expander may be used to compress the air (at 4) and also to drive compressor (15).

In an example, 84% of the heat exchanger combustion gas is recycled to the combustor instead of being used for steam raising or compression purposes as in the prior art. (5pp1644

EP-212755-A*

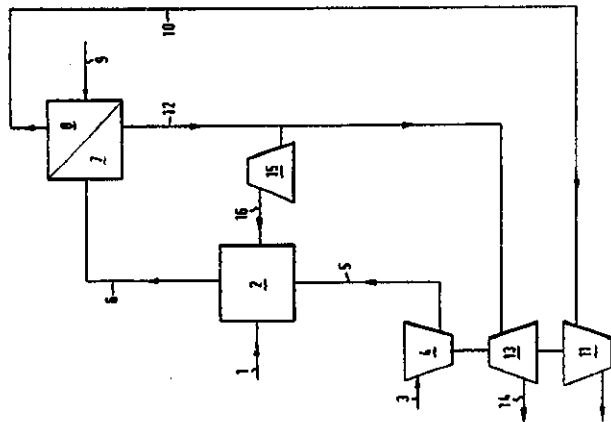
In a process for producing synthesis gas by catalytic reforming of hydrocarbons with steam in a reaction zone subjected to heat exchange with a combustion gas, the latter is at least partly recycled (pref. after compression) to the combustion zone.

An appts. for producing synthesis gas includes a reactor with internal heat exchanger, inlets and outlet from the heat exchanger for combustion gas, and a combustor apart from the reactor communicating with the heat exchanger inlet and outlet.

ADVANTAGE

The heat of the combustion gas leaving the heat exchanger outlet is retained in the system, instead of being lost or used for other purposes (e.g. raising steam, which may not be required in the quantity that could be produced). The temp. of the combustion zone is more readily controlled, less

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(E) ISR:- No Search Report



EP-212755-A