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 KERNFORSCHUNGS JULICH (UNIR) \*EP--66-258  
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 Superheated steam prodn. in catalytic methanation - using internally cooled methanation appts. to preheat and vaporise water

E(10-J2D, 31-A) H(4-E5) K(6-X) N(6).

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heat from a nuclear reactor, and the resulting synthesis gas is transported to a consumer for heat recovery by methanation (cf. DS1601001).

ADVANTAGES

Steps (c) and (d) improve the thermal efficiency of the process (cf. DE2949588).

EMBODIMENT

The fresh water (14) is pref. first preheated by heat exchange (21) with the product gas, then preheated to approx. satd. steam temp. in the 2nd internally cooled reactor (4), and then passed via a steam drum (16) to the 1st internally cooled reactor (1). The satd. steam from the 1st reactor (1) is passed via the same steam drum (16) to the superheater (3) downstream of the adiabatic reactor (2).

The synthesis gas is pref. preheated by heat exchange with part of the product gas from the 2nd internally cooled reactor (4) and the effluent gas from the adiabatic reactor (2) before being purified (25) and supplied to the reactors. (19pp367).

(G)ISR: DE2705141 DE2949588

D/S: E(AT BE CH FR GB IT LI LU NL SE)  
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Prodn. of superheated steam is effected by heat exchange during catalytic methanation of a synthesis gas stream contg. CO, CO<sub>2</sub> and H<sub>2</sub>. The process comprises (a) passing part of the gas stream through an internally cooled methanation reactor to generate satd. steam, (b) combining the partial stream with the rest of the synthesis gas and passing it through an adiabatic reactor and then through a heat exchanger to superheat the satd. steam, (c) passing the gas through a 2nd internally cooled reactor to preheat fresh water, and (d) using the preheated water as feed water for generating satd. steam in step (a).

USES

The process can form part of a heat transfer system in which hydrocarbons (esp. methane) are cracked using

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