

84-284214/46 E36 H08 ICIL 23.03.84
 IMPERIAL CHEM INDS PLC *GB 2139-644-A
 06.04.83-GB-009359 (+GB-007688) (14.11.84) C01b-03/36
 Synthesis gas prodn. from hydrocarbon(s) - by partial oxidn. followed
 by hydrocarbon injection and steam reforming

E(10-E4E, 31-A) H(4-C2, 4-E5, 4-F2C) N(2-D)

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zone within the shell downstream of the combustion zone, and
 and injection nozzle for hydrocarbon and opt. steam and/or
 CO₂ upstream of the catalyst zone.

USE

The prod. gas is suitable for prodn. of methanol.

ADVANTAGES

The amt. of CO₂ that has to be removed is less than in
 the process of GB2111602. Smaller plants can be used for a
 given gas output than in conventional processes.

SPECIFICALLY

The temp. of the gas leaving step (a) is 1093-1260°C and
 that of the gas leaving step (c) is 750-1050°C.

Step (a) is effected in a combustion zone of uniform cross
 section bounded, in order, by a layer of steam, a perforated
 inner shell through which the steam is fed, another layer of
 steam, and an external wall.

The catalyst may be in monolithic form with through-pass-
 ages parallel to the flow of reactants, or in the form of
 randomly packed units, each affording gas flow in at least two
 mutually transverse directions within its boundaries.

GB2139644-A*

C84-120555

CLAIMED PROCESS

Synthesis gas contg. H₂ and CO and/or CO₂ is produced
 by a continuous process comprising

(a) reacting a hydrocarbon feed with O₂ at superatmosph-
 eric pressure, the amt. of O₂ being insufficient for complete
 combustion, thus producing a hot gas contg. H₂ and CO;

(b) injecting a hydrocarbon and opt. also steam and/or
 CO₂ into the hot gas; and

(c) reacting the mixt. adiabatically over a steam-reforming
 catalyst to increase the H₂/CO_x ratio and reduce the temp. of
 the gas mixt.

CLAIMED APPARATUS

Reactor for producing synthesis gas, comprising an outer
 shell having an inlet for fuel and O₂, a combustion zone with
 an outlet for combustion prods., a shielding gas injection
 nozzle to prevent overheating of the outer shell, a catalyst

The cross-sectional area of the catalytic zone is 50-200% of that of the combustion zone.

The feed has an H/C atomic ratio of at least 3.5 and the product gas has an R value of 1.5-2.2. The gas may be cooled, treated to remove H₂O, compressed and passed over a Cu-contg. methanol synthesis catalyst. (7pp367MHDwgNo0/1).