25053 K/11 E36 H09 ZIMP- 20.07.81
ZIMPRO-AEC LTD *AU 8285-597
20.07.81-US-285380 (27.01.83) C01b-03/36 C10j-03/16

Synthesis gas prodn. by steam reforming or partial oxidn. - using wet oxidn. to control ratio of hydrogen to carbon mon:oxide

E(3i-A) H(4-E4, 4-E5, 9-C)

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C83-024515

Prodn. of synthesis gas is carried out by reacting a hydrocarbon with steam and opt. O_2 in a steam reformer or partial oxidn. gasifier. The improvement comprises reducing and controlling the H_2/CO ratio in the synthesis gas by (a) wet-oxidising combustible carbonaceous materials with O_2 to produce a gaseous mixt. of H_2O vapour and CO_2, and (b) injecting the mixt. into the synthesis gas producer.

The producer is pref. a natural gas steam reformer and the $H_2/(2CO + 3CO_2)$ ratio is pref. controlled to approach unity.

ADVANTAGES

The H_2/CO ratio can be reduced to values suitable for methanol synthesis without increasing the heat duty of the producer or reducing the overall synthesis gas yield.

EMBODIMENT

Wet oxidn. is effected by introducing carbonaceous materials (22), e.g. coal, coke, peat, heavy oil, wood, sewage sludge or refinery sludge, into the liq. water phase in a reactor (21), while simultaneously supplying O_2 (23) and water (24). The reactor is pref. operated at a higher pressure than the synthesis gas producer (35), and the produced H_2O/CO_2 mixt. is expanded through a power recovery turbine (26) and opt. cooled (29) and partially condensed (31) before being injected into the producer. Condensibles recovered from the synthesis gas may be recycled (43) to the wet oxidn. reactor.(20pp367).