

AIRP * **Q51** **91-268547/37** * **EP-445-000-A**
Methanol and fuel gas prodn. from carbon monoxide-rich synthesis gas - by reacting with water to give methanol and carbon dioxide and used in IGCC power generation process

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Prodn. of methanol and fuel gas from synthesis gas rich in carbon monoxide involves reacting the synthesis gas with water in a liq. phase reactor contg. a solid catalyst and an inert paraffinic hydrocarbon liq. to give an effluent stream which is separated to give a MeOH stream and a fuel gas stream contg. H₂, CO and CO₂.

Electric power may be produced in an IGCC process by generating steam by indirect heat exchange with the effluent stream and using this steam together with gases produced by combusting the fuel gas in compressed air, to drive a gas turbine.

USE/ADVANTAGE - Used in the prodn. of MeOH from CO-rich syngas such as that obtained from coal. Addition of water to CO-rich syngas in a liq. phase reactor enables the water-gas shift reaction and methanol synthesis to take place simultaneously, thus removing the necessity for a separate shift reactor. Heat from the synthesis improves the efficiency of the power generation. Addition of water moves the CO + H₂O to CO₂ + H₂ equilibrium to the right, increasing MeOH prodn. Water can be added as a liq. (claimed). Also intermittent addition of water is found to prolong catalyst life. (24pp Dwg.No.0/9)

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