

Publication

EP 0724780 A4 19960911

Application

EP 94931313 A 19941006

Priority

- US 9411358 W 19941006
- US 13344493 A 19931006
- US 30078494 A 19940901

Abstract (en)

[origin: WO9510126A1] A thermally integrated reformer (10) is located inside the stack furnace (12) housing stacks (14) of solid oxide fuel cells (16). The energy to support the endothermic reformation reaction converting hydrocarbon and water feedstock into hydrogen and carbon monoxide fuel is supplied by heat recovered from the oxidation process in the stack (14) of fuel cells (16). The source of hydrocarbons is de-sulfurized natural gas. Heat transfers to reformers (10) which may be incrementally shielded packed beds (30, 60) of the reactors (18, 19) of the reformer (10) by radiation from the stacks (14), furnace wall (38), or both and by forced convection from the exhausting airflow exiting the stack furnace (12). Temperature gradients in the reformer (10) may be controlled by selective (or incremented) radiation shielding (20) and by counterflow heat exchange to prevent excessive premature cracking in the reformer. Such an optimized design uses a minimum amount of catalyst, yet prevents carbonization from clogging interstices or otherwise rendering the catalyst or catalyst granules (32) ineffective. Alternatively sufficient catalyst may be provided to render the reformation process a heat-limited reaction. In this circumstance, the stacks (132) configured in a module (106) may transfer heat directly to a reformer (110) surrounding the module (106). The air may pass through a heat exchanger (108) or preheater (200) positioned proximate the module (106) in an insulated enclosure (102).

IPC 1-7

H01M 8/06

IPC 8 full level

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CPC (source: EP)

B01J 8/0085 (2013.01); **B01J 8/06** (2013.01); **C01B 3/384** (2013.01); **H01M 8/04074** (2013.01); **H01M 8/0625** (2013.01); **H01M 8/0631** (2013.01); **H01M 8/247** (2013.01); **H01M 8/04014** (2013.01); **H01M 8/04022** (2013.01); **H01M 8/249** (2013.01); **H01M 2008/1293** (2013.01); **H01M 2300/0074** (2013.01); **Y02E 60/50** (2013.01); **Y02P 20/10** (2015.11); **Y02P 20/129** (2015.11)

Citation (search report)

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- [X] FR 1585403 A 19700123
- [X] US 5047299 A 19910910 - SHOCKLING LARRY A [US]
- [X] WO 9111034 A1 19910725 - INT FUEL CELLS CORP [US]
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- [PX] WO 9418712 A1 19940818 - BOSSEL ULF DR [CH]
- [X] PATENT ABSTRACTS OF JAPAN vol. 012, no. 174 (E - 612) 24 May 1988 (1988-05-24)
- See references of WO 9510126A1

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