

To make a Micro-Scale Reformer with LTCC for portable fuel cell systems

박정주, 형우찬, 함승주*, 정찬화¹
연세대학교; ¹성균관대학교
(haam@yonsei.ac.kr*)

Reformer was studied various design prior time. At now, to make a micro-reactor compared with previous study, an integrated steam reformer and partial oxidation processor was developed by assembling unit reactors, which were fabricated by stacking and bonding microchannel patterned low temperature co-fired ceramic(LTCC), including fuel vaporizer, heat exchanger, partial oxidation, steam reformer. Commercially available CuO/ZnO/Al₂O₃ catalyst and Pt/Al₂O₃ were used for steam reforming and partial oxidation, respectively. A method of catalyst coating was loaded by 'water-based fill-and-dry coating' and 10 μ m coating thickness was deposited inside the microchannel of a reformer unit. This coating method represents a superior geometry since it provides lower pressure drop, ease of manufacturing and good adhesion after drying and calcination. The operating temperature of steam reformer and partial oxidation were 280~320 $^{\circ}$ C and 180~220 $^{\circ}$ C, respectively. To calculate products, Gas Chromatography was used. Acknowledgements : The authors gratefully acknowledge financial support from Korea Science and Engineering Foundation(2004-0535-000), Republic of Korea.