

Design and Fabrication of Micro-Reformer for Micro-Fuel Cell Application

김옥윤, 함승주*, 홍종철¹, 정찬화¹
연세대학교; ¹성균관대학교
(Haam@yonsei.ac.kr*)

The high efficiency of energy in combined heat and power systems is one of the most attractive research fields in recent energy technology. A direct methanol fuel cell is too larger to be used as a portable power source and relatively lower efficiency compared to polymer electrolyte membrane fuel cell (PEMFC) which uses hydrogen as a fuel source. The major difference between DMFC and PEMFC is that PEMFC requires a reformer. Therefore, for operating a highly efficient micro fuel cell, the development of micro-reformer is necessary. We have designed micro-reformer processor system, which is suitable for a micro - fuel cell. Micro-reformer processor system generates H₂ rich gas from a methanol. In our experiment, we have integrated micro-fuel processor system using low temperature co-fired ceramics (LTCC) process. Because LTCC is superior to other materials principally due to their high thermal and chemical stability, simpler fabrication processes, and lower materials cost. Therefore, we have studied and integrated micro-reformer processor system containing embedded heaters, cavities, and 3D structures of micro-channel with LTCC. Also we have optimized the LTCC process.