

Development of Anode Materials with Unique Microstructures for Low-Temperature SOFCs

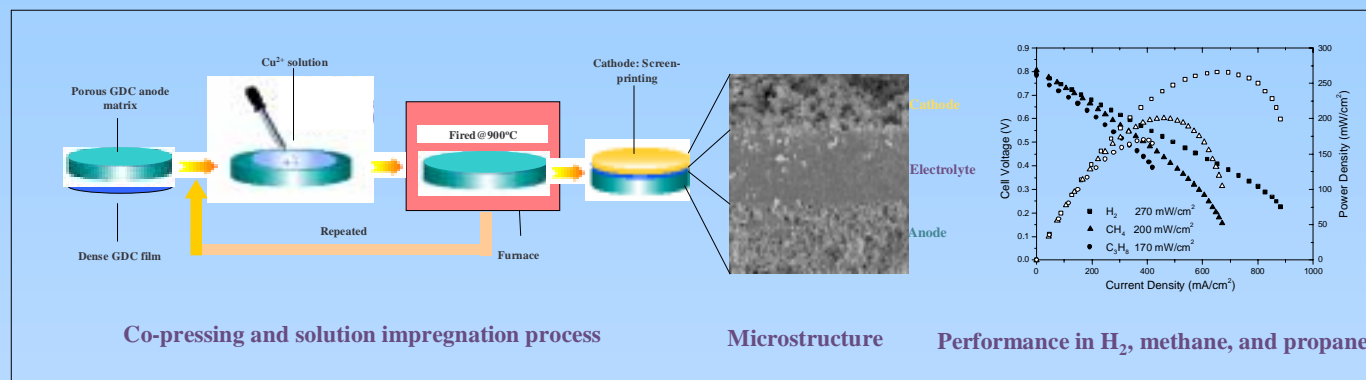
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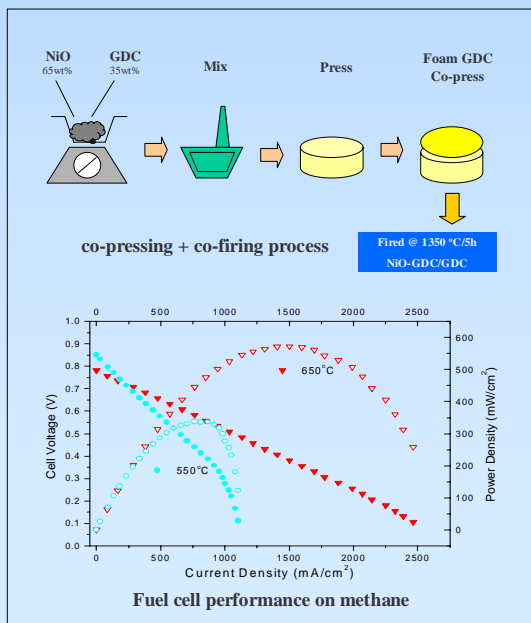
Abstract

It is well known that the critical issues facing the development of economically competitive SOFC systems include lowering the operation temperature and creating novel anode materials and macrostructures capable of efficiently utilizing hydrocarbon fuels. In this poster we report our recent progress in developing more efficient anodes for direct utilization of methane and propane in intermediate-temperature SOFCs. Some unique processes/techniques are being developed to fabricate anodes with desired compositions and microstructures. Moreover, a pre-forming process was also developed for converting propane (or higher hydrocarbon fuels) to CO, H₂, and CH₄. Preliminary results indicate that SOFCs that run on pre-reformed propane showed much better performance than the ones that run directly on propane.

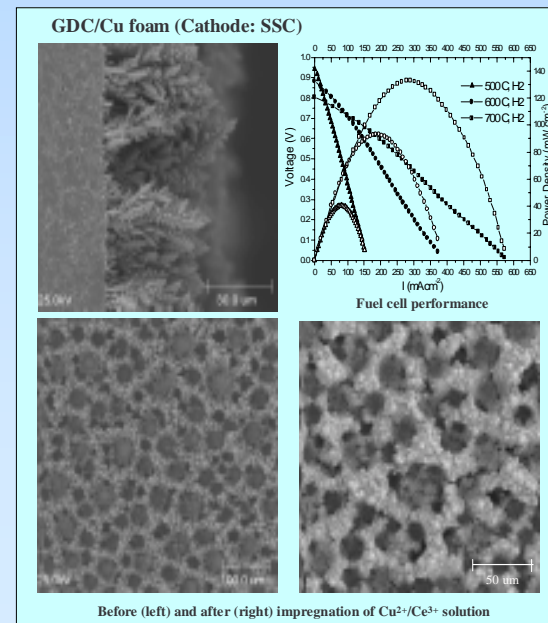
Cu/GDC - Supported SOFC



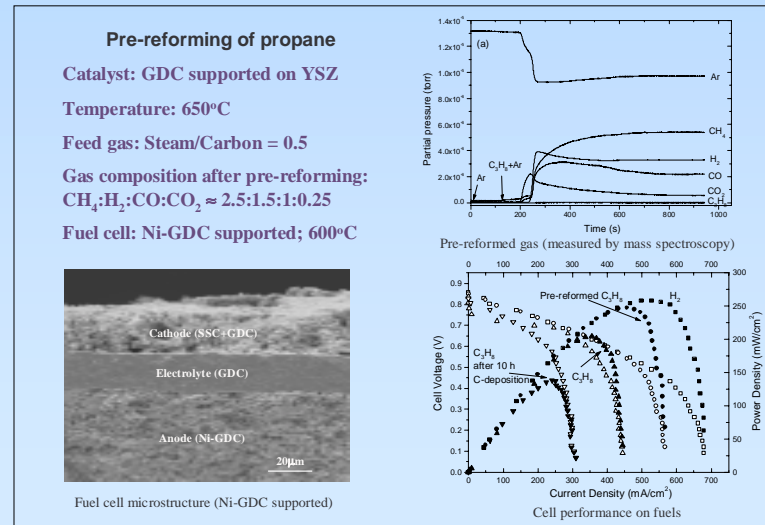
Anode-Supported SOFC (Ni-Based Anodes)



Dendritic Cu/GDC Composite Anode (Prepared by Electrochemical Deposition)



Fuel Processing (Steam Pre-reforming of HC Fuels)



Acknowledgement

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