

6th International Conference on

GREEN ENERGY AND EXPO

August 29-31, 2018 | Toronto, Canada



Majid Ghassemi

K N Toosi University of Technology, Iran

Effect of operating parameters on micro-planar proton conducting solid oxide fuel cell performance

As known one of the most drawbacks of solid oxide fuel cell (SOFC) is high operation temperature (i.e., 800 °C). One of the suggested remedies is to replace the oxygen ion conducting electrolyte with proton ion conducting one. The purpose of the current study is to numerically study the effect of operating parameters such as inlet fuel, oxidant temperature, and inlet oxidant flow rate on the performance of a two-dimensional micro-planar proton conducting SOFC. Fuel is a mixture of methane, hydrogen, carbon monoxide, carbon dioxide and water (so there are internal reforming and water-gas shift reactions). An in-house computational fluid dynamics code is utilized to solve the nonlinear governing equations of mass, momentum, energy, charge balance and gas-phase species coupled with kinetics equations. Results show that an increase in inlet fuel and oxidant temperature decreases the efficiency of a proton-conducting solid oxide fuel cell which is a due rise in temperature gradient along the cell length. In addition, the increase in oxidant flow rate improves the electrochemical reaction in the cathode side and causes the reduction in operating temperature of proton conducting SOFC.

Biography

Majid Ghassemi is a Professor of Mechanical Engineering Department at the K. N. Toosi University of Technology in Tehran, Iran. Professor Ghassemi has over 20 years of academic and industrial experience and served as the President of the K. N. Toosi University of Technology from 2010 through 2013. Professor Ghassemi has also served in several public and private boards and panels and supervised several undergraduate, masters and PhD students, published several books and many journal and conference papers. He is currently an Editor-in-Chief of the International Journal of Prevention and Treatment and Managing Editor of the American Journal of Mechanical Engineering (AJME) as well as Editorial Board member for many international journals. He also serves as member in several international conferences. Professor Ghassemi received his Ph.D. in Mechanical Engineering from Iowa State University in 1993.

ghassemi@kntu.ac.ir

Notes: