Experimental and numerical studies of portable PEMFC stack

Electrochimica Acta
Pages:
2899-2911
Volume:
54
Issue:
10
Date:
Thursday, January 1, 2009
DOI:
http://dx.doi.org/0.1016/j.electacta.2008.11.008

The objective of this work is to establish the design principles of a proton exchange membrane (PEM) fuel cell (FC) stack for portable applications. A combination of experiments and numerical simulations were carried out and the results analyzed to enhance understanding of the behavior of this portable PEMFC stack. A three-dimensional (3D) computational fluid dynamics (CFD)-based methodology was used to predict such as the current and temperature distributions of this portable PEMFC stack. The results show how the baseline operation and original design of this stack impact the local temperature, water content, water transport, and kinetic variables inside the individual cells. The outcome of this work will pursue the development of universal heuristics and dimensionless numbers correlated to portable PEMFC stack design.

Author Name:
S. Shimpaleea
M. Ohashia
J.W. Van Zeea
C. Zieglerb
C. Stoeckmann
C. Sadeler
C. Hebling

Industries:
Products: