

Contents

Preface	ix
Introduction	xi
CELL AND STACK DEVELOPMENT/PERFORMANCE	
Development of Novel Planar Nano-Structured SOFCs Tim Van Gestel, Doris Sebold, Wilhelm A. Meulenber, and Hans-Peter Buchkremer	3
Advanced Cell Development for Increased Direct JP-8 Performance in the Liquid Tin Anode SOFC M. T. Koslowske, W. A. McPhee, L. S. Bateman, M. J. Slaney, J. Bentley, and T. T. Tao	27
Fundamentals of Liquid Tin Anode Solid Oxide Fuel Cell (LTA-SOFC) Operation Randall Gemmen, Harry Abernathy, Kirk Gerdes, Mark Koslowske, William A. McPhee, and Tomas Tao	37
A No Chamber Fuel Cell Using Ethanol as Flame Kang Wang, Jeongmin Ahn, and Zongping Shao	53
CHARACTERIZATION/TESTING	
Surface Enhanced Raman Spectroscopy for Investigation of SOFC Cathodes Kevin S. Blinn, Harry W. Abernathy, and Meilin Liu	65
Characterization of an Anode-Supported Planar Solid Oxide Fuel Cell with a Porosity Concentration Gradient Chung Min An, Jung-Hoon Song, Inyoung Kang, and Nigel Sammes	75

Impact of Protective and Contacting Layers on the Long-Term SOFC Operation	83
Mihails Kusnezoff, Stefan Megel, Viktor Sauchuk, Egle Girdauskaite, Wieland Beckert, and Andreas Reinert	

Curvature Evolution and Control in Anode Supported Solid Oxide Fuel Cells	95
Marco Cologna, Anna Rita Contino, Vincenzo M. Sglavo, Stefano Modena, Sergio Ceschini, and Massimo Bertoldi	

Phase-Boundary Grooving at Surfaces of Solid Oxide Fuel Cell Materials	105
Sanjit Bhowmick, Jessica L. Riesterer, Yuan Xue, and C. Barry Carter	

ELECTRODES

Mixed Proton-Oxide Ion-Electron Conducting Cathode for SOFCs Based on Oxide Proton Conductors	115
Lei Yang, Shizhong Wang, Ze Liu, Chendong Zuo, and Meilin Liu	

Permeation and Stability Investigation of $\text{Ba}_{0.5}\text{Sr}_{0.5}\text{Co}_{0.8}\text{Fe}_{0.2}\text{O}_{3-\delta}$ Membranes for Oxy-Fuel Processes	121
A. Ellett, D. Schlehner, L. Singheiser and T. Markus	

Numerical Continuum Modeling and Simulation of Mixed-Conducting Thin Film and Patterned Electrodes	129
Matthew E. Lynch, David S. Mebane, and Meilin Liu	

Laminar Flow and Total Pressure Effects in Solid Oxide Fuel Cell Electrode Pores and Their Effects on Voltage-Current Characteristics	139
V. Hugo Schmidt, R. R. Chien, and Laura M. Lediaeve	

OXIDE/PROTON CONDUCTORS

Temperature and Pressure Assisted Cubic to Rhombohedral Phase Transition in $\text{Sc}_{0.1}\text{Ce}_{0.01}\text{ZrO}_2$ by Micro-Raman	155
Svetlana Lukich, Cassandra Carpenter, and Nina Orlovskaya	

Synthesis and Activity of Cobalt-Doped Barium Cerium Zirconate for Catalysis and Proton Conduction	167
Aravind Suresh, Joysurya Basu, Nigel M. Sammes, C. Barry Carter, and Benjamin A. Wilhite	

<i>In Situ</i> X-Ray Diffraction and Raman Spectroscopy of LiF-Added $\text{Ba}(\text{Zr}_{0.7}\text{Ce}_{0.1}\text{Y}_{0.2})\text{O}_{2.9}$ Ceramics	175
C.-S. Tu, S. C. Lee, C.-C. Huang, R. R. Chien, V. H. Schmidt, and C.-L. Tsai	

SEALS

- Sealing Glasses for SOFC – Degradation Behaviour 185
Jochen Schilm, Axel Rost, Mihails Kusnezoff, and Alexander Michaelis
- Determination of Fracture Strength of Glass-Ceramic Sealant Used in SOFC 195
Kais Hbaieb
- Creep Behavior of Glass/Ceramic Sealant Used in Solid Oxide Fuel Cells 203
W.N. Liu, X. Sun, B. Koeppel, and M.A. Khaleel
- Thermal Cycle Durability of Glass/Ceramic Composite Gas-Tight Seals on Metal Substrates 211
Seiichi Suda, Masahiko Matsumiya, Koichi Kawahara, and Kaori Jono

MECHANICAL BEHAVIOR

- Mechanical Properties of Cathode-Interconnect Interfaces in Planar SOFCs 221
Yanli Wang, Beth L. Armstrong, Rosa M. Trejo, Jianming Bai, Thomas R. Watkins, and Edgar Lara-Curzio

MATERIALS SYNTHESIS

- Synthesis and Characterization of Oxide Nanoparticles for Energy Applications 233
Joysurya Basu, Jonathan P Winterstein, Sanjit Bhowmick, and C. Barry Carter
- Glycine-Nitrate Synthesis and Characterization of $\text{Ba}(\text{Zr}_{0.8-x}\text{Ce}_x\text{Y}_{0.2})\text{O}_{2.9}$ 239
R. R. Chien, V. Hugo Schmidt, S.-C. Lee, C.-C. Huang, and Stachus P. Tu

FUEL REFORMING

- Carbon Dioxide Reforming of Methane on Nickel-Ceria-Based Oxide Cermet Anode for Solid Oxide Fuel Cells 251
Mitsunobu Kawano, Hiroyuki Yoshida, Koji Hashino, Toru Inagaki, Hideyuki Nagahara, and Hiroshi Ijichi
- Author Index 261