
Fuel Cell Seminar & Energy Exposition 2015

Editor:

M. C. Williams



Published by
The Electrochemical Society
65 South Main Street, Building D
Pennington, NJ 08534-2839, USA
tel 609 737 1902
fax 609 737 2743
www.electrochem.org

ecs transactions™

Vol. 71, No. 1

Copyright 2016 by The Electrochemical Society.
All rights reserved.

This book has been registered with Copyright Clearance Center.
For further information, please contact the Copyright Clearance Center,
Salem, Massachusetts.

Published by:

The Electrochemical Society
65 South Main Street
Pennington, New Jersey 08534-2839, USA

Telephone 609.737.1902
Fax 609.737.2743
e-mail: ecs@electrochem.org
Web: www.electrochem.org

ISSN 1938-6737 (online)
ISSN 1938-5862 (print)
ISSN 2151-2051 (cd-rom)

ISBN 978-1-62332-352-3 (Softcover)
ISBN 978-1-60768-710-8 (PDF)

Printed in the United States of America.

ECS Transactions, Volume 71, Issue 1
Fuel Cell Seminar & Energy Exposition 2015

Table of Contents

<i>Preface</i>	<i>iii</i>
Japan Has Great Expectations for a Hydrogen Society <i>N. Behling, M. C. Williams, S. Managi</i>	1
Examination of NON-Contacting Measurement Method of POWER Generation Current inside Single Polymer Electrolyte CELL Using Simulated Annealing <i>T. Kitabayashi, Y. Gotoh, M. Izumi, T. Nara</i>	13
Evaluation of the Effect of Temperature and Voltage on MIEC High-Temperature Solid Oxide Hybrid Systems <i>H. Zhang, M. C. Williams</i>	21
High Performance MEA Development and Application for High Power Output DMFC <i>N. Wan, K. Oku, Z. Guo, H. Takakuchi, M. Ohashi</i>	39
A Hydrogen Pressure Control Scheme Based on Experimentally-Derived Simulation Model for Hydrogen Generation System <i>K. Tomoda, T. Fukuzawa, N. Hoshi, N. Katayama, A. Yoshizaki, K. Hirata</i>	47
Evaluation of High-Temperature Electrolyser Systems <i>W. Winkler, A. Suzuki, A. Miyamoto, M. C. Williams</i>	55
Activities of FCV/Infrastructure Demonstration Program in Japan <i>Y. Nagai, T. Ikeda, F. Yamanashi, Y. Sone, M. Hirose, T. Abe, A. Okamoto, K. Matsuda, S. Kaneko, H. Ito</i>	65
Comparison of Fuel Consumption and Fuel Cell Degradation Using an Optimised Controller <i>T. Fletcher, R. H. Thring, M. Watkinson, I. Staffell</i>	85

Verification of Appropriate Temperature Range of Acid Accelerant in Hydrogen Generation System from NaBH ₄ <i>R. Funakawa, T. Fukuzawa, K. Tomoda, N. Hoshi, N. Katayama, A. Yoshizaki, K. Hirata</i>	99
Elucidation of Degradation Factor Distribution in a Same Electrode on PEFC <i>K. Sugiura, N. Takahashi, A. Daigo, T. Murakami</i>	107
Measurement of Oxygen Partial Pressure in Fuel Electrode of SOFC <i>R. Fujimatsu, T. Oda, M. Kobayashi, H. Ohka, M. Izumi</i>	113
Consideration on Acid Accelerator Oriented to Reproduction of Sodium Borohydride from By-Product <i>T. Fukuzawa, K. Tomoda, R. Funakawa, N. Hoshi, N. Katayama, A. Yoshizaki, K. Hirata</i>	123
Fuel Cell Powered Data Centers: In-Rack DC Generation <i>L. Zhao, J. Brouwer, S. James, E. Peterson, D. Wang, J. Liu</i>	131
Development of New Model of Fuel Cell Systems <i>J. Koda, T. Tairako, A. Sano, K. Yamada, T. Watanabe, K. Kobayashi</i>	141
24 Hour Test of the Fuel Cell System for an Autonomous Underwater Vehicle <i>M. Gilljam, H. Weydahl, T. Lian, T. C. Johannessen, S. I. Holm, J. Hasvold</i>	145
ISO 19880-1, Hydrogen Fueling Station and Vehicle Interface Technical Specification <i>J. M. Schneider, G. Dang-Nhu, N. Hart</i>	155
Numerical Simulation of Hydrogen Absorption Process in Metal Hydride Cartridge for Mobile Devices <i>N. Katayama, K. Dowaki, M. Hayase</i>	173
A Novel Hybrid Reformer-Electrolyzer-Purifier (REP) for Distributed Production of Low-Cost, Low Greenhouse Gas Hydrogen <i>L. Zhao, J. Brouwer, F. Jahnke, M. Lambrech, P. Patel</i>	179
A Comparison of Fuel Cell and Energy Storage Technologies' Potential to Reduce CO ₂ Emissions and Meet Renewable Generation Goals <i>K. Forrest, B. Shaffer, B. Tarroja, S. Samuelsen</i>	193

Development of Micro-PEFC of the Same Shape as C Size Battery <i>K. Sugiura, Y. Matsui, Y. Kanoko, S. Tanaka</i>	205
Fabrication of Catalyst Layers for Anion Exchange Membrane Fuel Cells By Using Electrospray Deposition. <i>T. Yamanaka, N. Katayama, S. Kogoshi</i>	211
Grasp of Correlation between Degradation Factor and Cell Position of PEFC Stack <i>Y. Matsumoto, K. Sugiura, A. Daigo, T. Murakami</i>	217
Hydrogen and Fuel Cell: A Cinderella or a Disruptive Low-Carbon Solution? <i>M. V. Romeri</i>	227
The Impact of the Operational Parameters on the PEM Fuel Cell Long-Term Performance <i>V. Andrea, P. D. S. P. Oliveira, E. I. Santiago, M. Linardi</i>	233
Building a Cost Effective Infrastructure with Green Hydrogen <i>T. Lowe, P. D. Madden</i>	239
Optimal Sizing and Dynamic Dispatch of a Solid Oxide Fuel Cell with Photovoltaic Panels and a Battery for Buildings <i>G. L. H. Nguyen, J. Brouwer, F. Jabbari</i>	277
Transient Analysis of 220 kW Solid Oxide Fuel Cell-Gas Turbine Hybrid System Using Computational Fluid Dynamics Results <i>M. A. Azizi, J. Brouwer</i>	289
Control Strategies for Irreversible Fuel Cell Heat Engine Systems <i>M. C. Williams, R. Gemmen, K. Gerdes</i>	303
"H2Ride" Fuel Cell Plug-in Shuttle Bus Demonstration Project at Hawaii Volcanoes National Park and Hydrogen Fueling Demonstration Project on the Big Island of Hawaii <i>M. Ewan</i>	321
Cost Effective Method for Measuring to the SAE Spec Contamination in Hydrogen <i>P. Bossard, A. Kaldor, A. Modi, A. B. Stubbmann</i>	341
Author Index	353