

The Journal of Fuel Cell Technology

Contents

Foreword

■ Challenges for Popularization of Residential Fuel Cell System

M. Mohri—Director, Senior Vice President,
Executive Director of The Fuel Cell & Merchandise Business Division,
Deputy Director of The Research & Development Division, Nippon Oil Corporation 1

Special Issue Solid Oxide Fuel Cell and Related Technologies

■ New Features in SOFC Development

H. Yokokawa—National Institute of Advanced Industrial Science and Technology 6

■ Development of High Efficiency Solid Oxide Fuel Cell(SOFC)Power Generation System at MHI

Y. Kobayashi—Mitsubishi Heavy Industries, Ltd. 12

■ Development of Intermediate Temperature SOFC at MMC and KEPCO

K. Hosoi—Mitsubishi Materials Corp.
F. Nishiwaki—Kansai Electric Power Co., Inc. 19

■ Current Status of SOFC Development at Tokyo Gas

Y. Matsuzaki—Tokyo Gas.Co.,Ltd. 24

■ Development of Tubular SOFC at TOTO

A. Ueno—TOTO Ltd. 27

■ Development and Field Trial of 1kW-class SOFC System

K. Hisada—Toho Gas Co.,Ltd. 31

■ Outline of Advanced Ceramic Reactor Project and Development of High Performance Micro Tubular SOFCs

M. Awano, Y. Fujishiro, T. Suzuki, T. Yamaguchi—
National Institute of Advanced Industrial Science and Technology 34

■ Development of IT-Solid Oxide Fuel Cell by Nano-particle Technology - Ni-ceria cermet anode of SOFC for lower temperature operation less than 650

T. Fukui—Hosokawa Powder Technology Research Institute 41

■ Fabrication by Electrostatic Spray Deposition and Performance Tests of Thin Electrolyte Film for Solid Oxide Fuel Cell

H. Nomura—Nihon University
J. Robert Selman—Illinois Institute of Technology 47

Topics

■ Outline and Point of Budget Related to Fuel Cell in 2006 Fiscal Year

Y. Ando—Agency of National Resources and Energy(METI) 51

■ CO₂ Separation Technique Using Lithium-Containing Oxide

M. Kato—TOSHIBA Corp. 57

■ Development of Nano-Composite Materials Composed of Light Elements for Hydrogen Storage

H. Fujii and T. Ichikawa—Hiroshima University 61

■ Development of Sewage Sludge Gasification Process -Hydrogen Production from Sewage Sludge-

H. Yabe and H. Tohma — Nippon Steel Co. 66

■ Development of the "Solid-State Methanol" Fuel for Direct Methanol Fuel Cells(DMFC)

M. Yagi and S. Satou —Kurita Water Industries Ltd. 72

■ Collection of CO₂ and Production of H₂ by Iron

E. Hiromi—National Institute for Materials Science 76

■ Novel Electrochemical Hydrogen Producing Process

R. Okuyama—GS Yuasa Corp. 80

●The cover is

"1kW class SOFC cogeneration field test at NEXT 21"
(Designed from the photograph offered from Osaka Gas)

Vol.5 No.4 Spring 2006

- **H₂ Production from Formic Acid using an Innovative Bioprocess**
H. Kawaguchi and H. Yukawa—Research Institute of Innovative Technology for the Earth …… 83
- **Development of Porous Catalyst/Fiber Composites by a Papermaking Technique**
A. Tomoda and R. Suzuki—F.C.C. Co., Ltd.
T. Kitaoka—Kyushu University …… 86
- **A Storage and Supply System of Hydrogen Derived from Renewable Energy**
K. Tanabe—Hrein Energy Inc. …… 91
- **Studies of the Effect of Dot Matrix Catalyst Layer Formation on Fuel Cell Performance**
Y. Anan, N. Okumura, M. Sugita, T. Yamabe—Nagasaki Institute of Applied Science …… 95
- **Proton Conductivity Simulator for Electrolyte Membrane Compounds Used in PEFC**
H. Nobutoki—Mitsubishi Electric Corp. … 100
- **Hydrogen Separation Module with Structured Catalyst for Use in Membrane Reformer**
T. Shimamori—NGK Spark Plug Co., Ltd.
I. Yasuda—Tokyo Gas Co., Ltd. … 105
- **High Performance Thermal Insulation Microtherm**
N. Iwadate—Nippon Microtherm Co.Ltd. … 107

Basic Lecture

- **Materials Design for Fuel Cells by Integrated Computational Chemistry Method:4. Fundamentals of EAM Molecular Dynamics and Its Application to Reaction Phenomena on Catalyst in Fuel Cell**
T. Tokumasu, H. Tsuboi, M. Koyama, A. Endou, M. Kubo,
Carlos A. Del Carpio, A. Miyamoto—Tohoku University … 111

Contribution

- **Fuel Cell Bus Practical Application Promotion Project**
Y. Shibata—Ministry of Land, Infrastructure and Transport(MLIT) … 117
- **Fuel Cell Hybrid Bus Operation near the Central Japan International Airport(Centrair)**
S. Kawatsu—Toyota Motor Corp. … 120

Reportage

- **2nd Int'l Hydrogen & Fuel Cell Expo**
S. Shiozawa—FCDIC … 124

Venture

- **Magnesium Hydride(MgH₂)and New Direct Water Fuel Cell**
N. Tsuji—TECHNO BANK Co.,Ltd. … 126

Report

- **98th FCDIC Workshop for Member—Trend of Deregulation for H₂ Society and Safety of FCV**
A. Miyahara—FCDIC … 132
- **99th FCDIC Workshop for Member—JAMSTEC Visit Note**
S. Onodera—Tokyo Electric Power Co. … 134
- **Supplement of 2005 Fuel Cell Seminar Report**
S. Nagata—FCDIC … 135

Information

S. Nagata—FCDIC … 140

Postscript

H. Kato—The Japan Gas Association … 149