

# TABLE OF CONTENTS

## SOFC STATUS

U. S. DOE Office of Fossil Energy's Solid Oxide Fuel Cell Programs.....	3
<i>Mark C. Williams and Joseph P. Strakey</i>	
Status of National Project for SOFC Development in Japan .....	9
<i>Hiroshi Fujii</i>	
The Revolution Through Evolution: Delphi Solid Oxide Fuel Cell for APU and Hydrogen Reformation.....	16
<i>Jean J. Botti</i>	
Solid Oxide Fuel Cell Development at PNNL.....	31
<i>J. W. Stevenson, S. Baskaran, L. A. Chick, Y.-S. Chou, J. E. Deibler, M. A. Khaleel, O. A. Marina, K. D. Meinhardt, D. M. Paxton, L. R. Pederson, K. P. Recknagle, S. P. Simner, V. Sprenkle, K. S. Weil, Z. G. Yang, P. Singh and G. L. McVay</i>	

## SOFC STACKS AND SYSTEMS

Solid Oxide Fuel Cell Systems for Power Generation Applications .....	43
<i>Nguyen Minh</i>	
Design and Manufacture of CFCL's Modular and Thermally Cyclable Stack Technology.....	48
<i>Karl Föger and Jonathan Love</i>	
Development of MOLB Type SOFC .....	53
<i>Akihiro Nakanishi, Masatoshi Hattori, Yoshinori Sakaki, Hitoshi Miyamoto, Hidetoshi Aiki, Koichi Takenobu and Masanori Nishiura</i>	
Following the Critical Path to Commercialization: An Update on Global Thermoelectric's SOFC Technology and Product Development.....	60
<i>Brian Borglum, Jen-Jung Fan and Eric Neary</i>	
Development of Tubular Type SOFC Module.....	70
<i>Hiroaki Takeuchi, Akira Ueno, Masahiro Kuroishi, Susumu Aikawa and Toshiya Abe</i>	

Scale Up of a Multi-Functional Solid Oxide Fuel Cell to Multi-Tens of Kilowatt Level (MF-SOFC) .....	78
<i>G. D. Agnew, N. T. Hart, G. J. Wright, M. Cassidy, R. D. Collins, P. D. Butler, N. Bonanos, H. S. Thomsen, J. J. Bentzen, Yi-Lin Liu, A. Atkinson, R. Travis, G. Bertrand, Corrine Di-Pastena, C. Thompson, M. A. Henson and M. J. Day</i>	
Development of a Solid Oxide Fuel Cell Stack by Delphi and Battelle .....	88
<i>Subhasish Mukerjee, Steven Shaffer, James Zizelman, Larry Chick, Suresh Baskaran, Matt Chou, Chris Coyle, John Deibler, Gary Maupin, Kerry Meinhardt, Dean Paxton, Tim Peters, Vince Sprengle, Scott Weil and Rick Williford</i>	
Recent Results of Stack Development at Forschungszentrum Jülich .....	98
<i>R. Steinberger-Wilckens, L. G. J. de Haart, I. C. Vinke, L. Blum, A. Cramer, J. Remmel, G. Bläß, F. Tietz and W. J. Quadakkers</i>	
Status of the SOFC Development at Haldor Topsøe/Risø .....	105
<i>Niels Christiansen, Steen Kristensen, Helge Holm-Larsen, Peter Halvor Larsen, Mogens Mogensen, Peter Vang Hendriksen, and Søren Linderoth</i>	
Development of Intermediate-Temperature SOFC Module Using Doped Lanthanum Gallate .....	113
<i>T. Yamada, N. Chitose, J. Akikusa, N. Murakami, T. Akbay, T. Miyazawa, K. Adachi, A. Hasegawa, M. Yamada, K. Hoshino, K. Hosoi, N. Komada, H. Yoshida, M. Kawano, T. Sasaki, T. Inagaki, K. Miura, T. Ishihara and Y. Takita</i>	
Development of Anode-Supported SOFC with Metallic Interconnectors .....	119
<i>Y. Baba, K. Ogasawara, H. Yakabe, Y. Matsuzaki and T. Sakurai</i>	
Portable SOFC Generator with Innovative SPIROCELLS .....	127
<i>Ulf Bossel</i>	
Micro Solid Oxide Fuel Cell .....	135
<i>Partho Sarkar and Hongsang Rho</i>	
 <b><u>ELECTROLYTE MATERIALS, PROCESSING AND PERFORMANCE</u></b> 	
Ion Conducting Ceramic Electrolytes: A Century of Progress .....	141
<i>Ronald S. Gordon</i>	
Nanomaterials for SOFC Electrolytes and Anodes on the Base of Zirconia .....	153
<i>T. E. Konstantinova, I. A. Danilenko, N. P. Pilipenko and G. K. Volkova</i>	

Dopant Segregation in Nanometric TZP Ceramics.....	160
<i>Elisabeth Djurado, Florence Boulc'h and Laurent Dessemond</i>	
Electrical Properties of YSZ Thin Films Deposited on Nanoporous Substrates .....	169
<i>Yong-il Park, Yuji Saito, Rojana Pornprasertsuk, Jeremy Cheng, Suk-won Cha and Fritz B. Prinz</i>	
Influence of Oxygen Vacancies and 26 D-Impurity on Electronic and Transport Properties of Zirconia.....	181
<i>Natalya Tokiy, Tatyana Konstantinova, Valentine Tokiy and Diana Savina</i>	
Influence of Powders on Ionic Conductivity of Polycrystalline Zirconias .....	187
<i>Keiji Yamahara, Craig P. Jacobson, Steven J. Visco and Lutgard C. De Jonghe</i>	
Long Term Stability of Yttria and Scandia Doped Zirconia Electrolytes.....	196
<i>Axel C. Müller, André Weber, Dirk Herbstritt and Ellen Ivers-Tiffée</i>	
Ageing of Solid Oxide Fuel Cells Based on Zirconia or Other Oxide Electrolytes.....	200
<i>G. Petot-Ervas and C. Petot</i>	
Electrolytic Damage in Zirconia Electrolytes .....	209
<i>Y. Matus, L. C. De Jonghe, X. -F. Zhang, S. J. Visco and C. P. Jacobson</i>	
Lanthanide Diffusion in Calcia Stabilized Zirconia: Experimental and Theoretical Study.....	214
<i>M. Kilo, M. A. Taylor, Ch. Argirusis, G. Borchardt, S. Weber, H. Scherrer and R. A. Jackson</i>	
Characterization of Cathode Supported Thin Film Electrolytes .....	222
<i>M. Becker, A. Weber, A. C. Müller and E. Ivers-Tiffée</i>	
Modeling of Binder Burnout and Sintering of Solid Oxide Electrolyte Tapes by Thermokinetic Analysis .....	229
<i>Axel C. Müller, Johannes R. Opfermann and Ellen Ivers-Tiffée</i>	
Densification of SOFC Yttria-Stabilized Zirconia Electrolytes Through Addition of Sintering Additives .....	238
<i>Norbert H. Menzler, Ralf Hansch, Robert Fleck, Günter Bläß, Hans Peter Buchkremer, Hermann Schichl and Detlev Stöver</i>	
Process and Characterization of YSZ Thick-Films Deposited by Electrophoretic Deposition for Intermediate-Temperature SOFC.....	246
<i>Giuseppe Savo, Alessandra D'Epifanio, Riccardo Polini and Enrico Traversa</i>	

Processing and Properties of Thin-Film Ceria Based SOFC .....	253
<i>Mariza Marrero-Cruz, Eric P. Hong, Craig P. Jacobson, Steven J. Visco and Lutgard C. De Jonghe</i>	
Oxygen Partial Pressure Dependence of Creep for Yttria-Doped Ceria Ceramics.....	261
<i>H. Yugami, Y. Endo, T. Yokobori, T. Otake, T. Kawada and J. Mizusaki</i>	
Microstructural and Electrical Properties of Gadolinium Doped Ceria Thin Films Prepared by Atomic Layer Deposition (ALD) .....	267
<i>E. Gourba, A. Ringuedé, M. Cassir, J. Pääväsaari, J. Niinistö, M. Putkonen and L. Niinistö</i>	
Structural Analysis of $Ce_{1-x}M_xO_{2-0.5x-\delta}$ (M = Gd, Sm, Y) by High Temperature XRD Under Various Oxygen Partial Pressures.....	275
<i>Shaorong Wang, Eri Oikawa and Takuya Hashimoto</i>	
Phase Transformation from Cubic to Rhombohedral in Doped $Bi_2O_3$ -CaO System .....	282
<i>Chaur-Chi Huang and Kuan-Zong Fung</i>	
Stable High Conductivity Bilayered Electrolytes for Low Temperature Solid Oxide Fuel Cells .....	289
<i>Jun-Young Park and Eric D. Wachsman</i>	
Lanthanum Gallate Electrolyte for Intermediate Temperature Operation .....	299
<i>S. Elangovan, S. Balagopal, D. Larsen, M. Timper, J. Pike and B. Heck</i>	
Cation Self and Impurity Diffusion in Poly-Crystalline $La_{0.9}Sr_{0.1}Ga_{0.9}Mg_{0.1}O_{2.9}$ .....	304
<i>Olaf Schulz, Stefan Flege and Manfred Martin</i>	
Dependence of Activation Energy on Temperature and Structure in Lanthanum Gallates.....	315
<i>John Bradley, P. R. Slater, T. Ishihara and John T. S. Irvine</i>	
Sol-Gel Synthesis and Phase Purity of $La_{1-x}Sr_xGa_{1-y}Mg_yO_{3-\delta}$ Solid Electrolytes.....	324
<i>Riccardo Polini, Arianna Pamio and Enrico Traversa</i>	
Plasma Sprayed LSGM Electrolyte for Intermediate Temperature Solid Oxide Fuel Cells.....	330
<i>S. (Rob) Hui, X. Ma, H. Zhang, J. Dai, J. Roth, T. D. Xiao and D. E. Reisner</i>	
Crystal Structure and Conductivity of Ba- and Y- Doped $LaAlO_3$ Solid Electrolyte .....	339
<i>Te-Yuan Chen and Kuan-Zong Fung</i>	

Charge Carrier Maps for $(\text{La}_{0.9}\text{Sr}_{0.1})\text{M}^{\text{III}}\text{O}_{3-\delta}$ ( $\text{M}^{\text{III}} = \text{Sc}$ and $\text{In}$ ) Perovskites and $(\text{Ce}_{0.8}\text{Sm}_{0.2})\text{O}_{2-\delta}$ Fluorite.....	349
<i>Katsuhiko Nomura, Tomonari Takeuchi, Shin-ichi Kamo, Hiroyuki Kageyama and Yoshinori Miyazaki</i>	
Electrical Conductivity Studies of Ti-Substituted $\text{Pr}_{0.45}\text{La}_{0.45}\text{Sr}_{0.1}\text{Ga}_{0.8}\text{Mg}_{0.2}\text{O}_{2.85}$ and Fe-Substituted $\text{SrSnO}_3$ .....	359
<i>V. Thangadurai and W. Weppner</i>	
Elaboration and Ionic Conduction of Apatite-Type Rare Earth Oxides .....	372
<i>Sophie Beaudet Savignat, Alexandre Lima, Christelle Barthet and Antoine Henry</i>	
Structure and Conductivity of a Yb-Doped $\text{SrCeO}_3$ - $\text{BaZrO}_3$ Solid Solution.....	379
<i>Olivier Antoine, Charles Hatchwell, Glenn C. Mather and Augustin J. McEvoy</i>	

## **CATHODE MATERIALS, PROCESSING AND PERFORMANCE**

Low Cost (La, Sr) $\text{MnO}_3$ Cathode Material with Excellent Electrochemical Properties.....	391
<i>Evelyn Proß, Jörg Laube, André Weber, Axel C. Müller and Ellen Ivers-Tiffée</i>	
Improvement of LSM Cathode for High Power Density SOFCs .....	400
<i>Wei Guo Wang, Rasmus Barfod, Peter Halvor Larsen, Kent Kammer, Janet J. Bentzen, Peter Vang Hendriksen and Mogens Mogensen</i>	
Synthesis, Structure and Electrophysical Properties of Cation-Deficient Lanthanum-Calcium Manganites .....	409
<i>N. F. Uvarov, A. P. Nemudry and Yu. G. Mateyshina</i>	
Development of Cathode Materials by Plasma Process at Room Temperature .....	414
<i>Mehrdad Nikravech, Frederic Rousseau, Daniel Morvan and Jacques Amouroux</i>	
Fabrication of High Performance (La, Sr) $\text{MnO}_3$ Cathodes by Ion Impregnation .....	422
<i>S. P. Jiang, Y. J. Leng, C. H. Chan and K. A. Khor</i>	
Identification of Gas-Diffusion Process in a Thick and Porous Cathode Substrate of SWPC Tubular SOFC Using AC Impedance Method.....	430
<i>Keqin Huang</i>	
Development of LSM/YSZ Composite Electrodes for Thin Film Solid Oxide Fuel Cells.....	440
<i>Y. J. Leng, S. H. Chan, K. A. Khor and S. P. Jiang</i>	

Low Temperature Composite Cathodes for SOFC Applications.....	451
<i>Matthew M. Seabaugh, Scott L. Swartz, Kathy Hasinska and Christopher T. Holt</i>	
Electrode Reaction Kinetics at $\text{La}_{1-x}\text{A}_x\text{MnO}_{3+\delta}$ (A = Sr, Ca) / YSZ Interface .....	458
<i>Kenji Yasumoto, Junichiro Mizusaki, Hibiki Itoh, Shaorong Wang, Hiroaki Tagawa and Masayuki Dokiya</i>	
In-Situ Measurement of Oxygen Potential Around (La, Sr)MnO <sub>3</sub> /YSZ Interface.....	470
<i>T. Kawada, M. Kudoh, K. Yashiro, A. Kaimai, Y. Nigara and J. Mizusaki</i>	
Oxygen Reactions at LaSrMnO <sub>3</sub> /Ytria-Stabilized Zirconia (LSM/YSZ) Interfaces .....	478
<i>A. C. Co, S. J. Xia and V. I. Birss</i>	
Electrochemical Impedance Spectroscopy Studies of Perovskite/YSZ Ceramic Films .....	488
<i>D. Z. de Florio, V. Esposito, G. Savo, E. Di Bartolomeo and E. Traversa</i>	
Use of an “Open” Triple-Phase Boundary to Demonstrate Where Chromium Contaminants Initially Deposit at the LSM-YSZ Interface .....	498
<i>S. C. Paulson and V. I. Birss</i>	
Mixed Conducting Porous SOFC Cathodes: Current Distributions and Polarization Resistances .....	509
<i>J. Fleig and J. Maier</i>	
Nonlinear Harmonic Response of Mixed-Conducting SOFC Cathodes.....	516
<i>S. B. Adler, J. R. Wilson and D. T. Schwartz</i>	
Microstructural and Electrochemical Characterisation of LSFC-Based Cathodes for Anode-Supported Solid Oxide Fuel Cells .....	525
<i>A. Mai, V. A. C. Haanappel, F. Tietz, I. C. Vinke and D. Stöver</i>	
Comparison Between LSCF-CGO and GSC-CGO Composite Cathodes on a CGO Electrolyte for IT-SOFC .....	533
<i>G. Sivasundram and J. A. Kilner</i>	
Elaboration of Ruddlesden-Popper Thin Film via a Sol-Gel Process for SOFC Cathode Materials.....	542
<i>Marie-Laure Fontaine, Christel Laberty-Robert, Florence Ansart, Antoine Barnabé and Philippe Tailhades</i>	
Evaluation of $\text{La}_2\text{Ni}_{1-x}\text{Co}_x\text{O}_{4\pm\delta}$ as a SOFC Cathode Material .....	552
<i>S. J. Skinner, C. N. Munnings, G. Amow, P. Whitfield and I. Davidson</i>	

Oxygen Transport and Electrochemical Activity of La <sub>2</sub> NiO <sub>4</sub> -Based Cathode Materials .....	561
<i>V. V. Kharton, A. A. Yaremchenko, E. V. Tsipis and J. R. Frade</i>	
Application of LaNi(Fe)O <sub>3</sub> as Air Electrode of Solid Oxide Fuel Cells .....	571
<i>Himeko Orui, Kimitaka Watanabe and Masayasu Arakawa</i>	
Electrochemical Characterisation of a La <sub>0.6</sub> Sr <sub>0.4</sub> Co <sub>0.2</sub> Fe <sub>0.8</sub> O <sub>3-δ</sub> Cathode for IT-SOFCs .....	580
<i>Audrey Esquirol, Nikolaos Bonanos, Nigel Brandon, John Kilner and Mogens Mogensen</i>	
Electrode Properties of La <sub>1-x</sub> Sr <sub>x</sub> CuO <sub>2.5-δ</sub> As New Cathode Materials for Intermediate Temperature SOFCs .....	591
<i>Ho-Chieh Yu and Kuan-Zong Fung</i>	
Effects of Water on Cathodic Performance of Ba <sub>0.6</sub> La <sub>0.4</sub> CoO <sub>3</sub> on the Cell Using LaGaO <sub>3</sub> -Based Oxide for Electrolyte .....	601
<i>Tatsumi Ishihara, Satoko Fukui, Hiroyasu Nishiguchi and Yusaku Takita</i>	
Precious Metal Thin-Films for SOFC Applications.....	611
<i>Ray England and Nigel Sammes</i>	
Noble Metals in SOFC Cathodes: Processing and Electrochemical Performance .....	615
<i>D. Rutenbeck, V. A. C. Haanappel, A. Mai, S. Uhlenbruck, F. Tietz and I. C. Vinke</i>	
Improved Solid Oxide Fuel Cell Performance with Sputtered Pt Catalyst .....	624
<i>Jen-Hau Wan and John B. Goodenough</i>	
Comparative Investigation of Polarization Mechanism of Sputter Deposited Cermet Cathode Interlayers by Impedance-Spectra Time Relaxation Transform Technique .....	632
<i>Nikolay Khramushin, Irina Prilezhaeva, Felix Pekhota and Nikolay Soloviev</i>	

## **ANODE MATERIALS, PROCESSING AND PERFORMANCE**

New Chemical Routes for Preparation of Ultrafine NiO-YSZ Powders for SOFC Anode Applications .....	643
<i>V. Esposito, C. D'Ottavi, S. Ferrari, S. Licoccia and E. Traversa</i>	
Effect of Anode Porosity and Pore Size on Electrochemical Performance .....	653
<i>Xiaohua Deng and Anthony Petric</i>	

Performance of YSZ-Supported Anode for SOFC Substrates .....	662
<i>A. Nakamura, S. Yokota, Y. Shimizu, H. Itoh, T. Yamamoto and K. Izumi</i>	
Reduction and Re-Oxidation Kinetics of Nickel-Based Solid Oxide Fuel Cell Anodes .....	670
<i>Nishant M. Tikekar, Tad J. Armstrong and Anil V. Virkar</i>	
Characterization of Anode/Electrolyte Interface for Advanced Anode Structures.....	680
<i>Axel C. Müller, Albert Krügel and Ellen Ivers-Tiffée</i>	
H <sub>2</sub> -H <sub>2</sub> O-Ni-YSZ Electrode Performance and Segregation to the Interface .....	686
<i>Karin Vels Hansen and Mogens Mogensen</i>	
Solid-Solutioning Effect of the Ni-Based Cermet on the Electrochemical Oxidation of Methane.....	695
<i>K. Sato, Y. Ohmine, K. Ogasa and S. Tsuji</i>	
Effect of Additive to Ni-YSZ Cermet on Reforming CH <sub>4</sub> and Electrochemical Activity for SOFC .....	704
<i>Tatsuya Takeguchi, Tatsuya Yano, Yukimune Kani, Ryuji Kikuchi and Koichi Eguchi</i>	
In Situ Observation of Deposited Carbon on Anode for Solid Oxide Fuel Cells .....	714
<i>Keiji Yashiro, Kenichiro Takeda, Tomoaki Taura, Takanori Otake, Atsushi Kaimai, Yutaka Nigara, Tatsuya Kawada, Junichiro Mizusaki and Hiroo Yugami</i>	
Characteristics of Anodic Polarization of Solid Oxide Fuel Cells Under Pressurized Conditions.....	720
<i>Ryuji Kikuchi, Tatsuya Yano, Tatsuya Takeguchi and Koichi Eguchi</i>	
A High-Performance Electrode for Medium-Temperature SOFC: Mixed Conducting Ceria-Based Anode with Highly-Dispersed Ni Electrocatalysts .....	728
<i>Hiroyuki Uchida, Shinsuke Suzuki and Masahiro Watanabe</i>	
Electrochemical Behaviour of Ni-Ce <sub>0.9</sub> Gd <sub>0.1</sub> O <sub>2-δ</sub> SOFC Anodes in Methane.....	737
<i>Bettina Rösch, Hengyong Tu, Andreas O. Störmer, Axel C. Müller and Ulrich Stimming</i>	
SOFC Anode for Direct Oxidation of CH <sub>4</sub> at Intermediate Temperatures .....	745
<i>A. Sin, A. Tavares, Y. Doubitsky, A. Zaopo, A. S. Aricò, L. R. Gullo, D. La Rosa, S. Siracusano and V. Antonucci</i>	



Evaluation of Mechanochemically Synthesized NiO/SDC Composite Nanopowders for the Development of Nanostructured Cermet Anodes.....	752
<i>James P. Hos and Paul G. McCormick</i>	
The Impact of Wood Derived Gasification Gases on Ni-CGO Anodes in IT-SOFCs .....	762
<i>Sylvia Baron, Nigel Brandon, Alan Atkinson and Brian Steele</i>	
A Comparison of Cu-Ceria-SDC and Au-Ceria-SDC Composites for SOFC Anodes .....	773
<i>C. Lu, W. L. Worrell, J. M. Vohs and R. J. Gorte</i>	
Electrodes for Oxidation of Methane .....	781
<i>K. Kammer and M. Mogensen</i>	
Direct Oxidation as a Market Enabler for Solid Oxide Fuel Cells.....	787
<i>Eduardo E. Paz, Conghua Wang, Ponnusamy Palanisamy, Raymond J. Gorte and John M. Vohs</i>	
Conductivity, Catalytic Property and Electrochemical Performance of a New Perovskite-Type SOFC Anode Material .....	793
<i>Shanwen Tao and John T. S. Irvine</i>	
First Results on a (La, Sr)CrO <sub>3</sub> Anode Fed with Methane.....	803
<i>J. Vulliet, B. Morel, J. Laurencin, G. Gauthier, L. Bianchi, S. Giraud, J-Y. Henry and F. Lefebvre-Joud</i>	
Cu <sub>0.7</sub> Fe <sub>0.3</sub> O <sub>x</sub> -SDCNL Anode for Reduced Temperature Solid Oxide Fuel Cell .....	812
<i>Xiao-Zhen Liao, Zi-Feng Ma and Bin Zhu</i>	

## **INTERCONNECTION, SEAL AND SOFC METALLIC MATERIALS AND PROCESSING**

Defect Formation and Thermal Expansion of Perovskites on the Basis of LaCrO <sub>3</sub> for Solid Oxide Fuel Cells .....	817
<i>A. Zuev, L. Singheiser and K. Hilpert</i>	
Anode Supported Interconnect for Electrolyte Membrane SOFC .....	832
<i>Kenji Yasumoto, Hibiki Itoh and Tohru Yamamoto</i>	
Evaluation of Metallic Interconnects for Use in Intermediate Temperature SOFC .....	841
<i>Tad J. Armstrong, Michael A. Homel and Anil V. Virkar</i>	
Metal Interconnect Development: Design and Long-Term Stability.....	851
<i>S. Elangovan, J. Hartvigsen, R. Lashway, S. Balagopal and I. Bay</i>	

Characterization of Fe-Cr Alloys in CH <sub>4</sub> Fuels for SOFC Interconnects .....	856
<i>Teruhisa Horita, Yueping Xiong, Haruo Kishimoto, Katsuhiko Yamaji, Natsuko Sakai and Harumi Yokokawa</i>	
Copper-Plated Stainless Steel for Bipolar Plates in Direct-Oxidation SOFC .....	865
<i>S.-I. Lee, S. McIntosh, J. M. Vohs and R. J. Gorte</i>	
Novel Fabrication Method for Interconnect Materials .....	872
<i>Clive R. Scorey and Richard P. Mason</i>	
A Low CTE Intermetallic Bipolar Plate .....	879
<i>W. E. Windes, L. D. Zuck, E. L. Shaber, A. E. Erickson and P. A. Lessing</i>	
Characterisation and Evaluation of Compression Loaded Sealing Concepts for SOFC Stacks .....	888
<i>Martin Bram, Stephan Reckers, Pere Drinovac, Josef Mönch, Rolf W. Steinbrech, Hans Peter Buchkremer and Detlev Stöver</i>	
Nickel/Ceramic Composites for Current Collection Terminals .....	898
<i>Xingguo Wei and Alan Atkinson</i>	
Current Collection and Stacking of Anode-Supported Cells with Metal Interconnects to Compact Repeating Units .....	905
<i>Michele Molinelli, Diego Larrain, Raphaël Ihringer, Laurent Constantin, Nordahl Autissier, Olivier Bucheli, Daniel Favrat and Jan Van herle</i>	
Total Solution of Metallic Materials for SOFCs .....	914
<i>Toshihiro Uehara, Akihiro Toji, Ken Inoue, Motoi Yamaguchi and Takehiro Ohno</i>	
Metallic Components for a Plasma Sprayed Thin-Film SOFC Concept .....	923
<i>Thomas Franco, Rudolf Henne, Michael Lang, Patrick Metzger, Günter Schiller, Patric Szabo and Sebastian Ziehm</i>	

## **CELL DESIGN, FABRICATION AND PERFORMANCE**

Global Thermoelectric's Integrated Cell Manufacturing of Planar SOFCs .....	935
<i>Eric Tang, Frank Martell, Rob Brulé, Kyle Marcotte and Brian Borglum</i>	
Material Design and Processing of CFCL's Cell Assembly .....	944
<i>Raj Ratnaraj, Khaliq Ahmed, Jon Love, Sudath Amarasinghe, Olivier Bellon and Karl Föger</i>	
Solid Oxide Fuel Cell Research and Development Program at the Connecticut Global Fuel Cell Center .....	953
<i>Nigel M. Sammes and Ken Reifsnider</i>	

Planar SOFCs and Stacks Development at IPPE .....	963
<i>Andrei Gulevich, Nikolai Khramushin and Vladimir Roujnikov</i>	
Solid Oxide Fuel Cells with YSZ Films Prepared Using Spray Pyrolysis .....	970
<i>D. Perednis and L. J. Gauckler</i>	
Low Temperature Technologies for SOFC .....	976
<i>V. Petrovsky, H. U. Anderson and T. Petrovsky</i>	
R&D for Low Temperature (300 to 600°C) SOFCs .....	985
<i>Bin Zhu, Juncai Sun, Zifeng Ma, Qizhao Lin, Zhigang Zhu and Zongqiang Mao</i>	
High Performance Cell Development Using Scandia Doped Zirconia Electrolyte for Low Temperature Operating SOFCs .....	995
<i>Hirofumi Sumi, Kenji Ukai, Koji Hisada, Yasunobu Mizutani and Osamu Yamamoto</i>	
Fabrication and Performance of Anode-Supported Solid Oxide Fuel Cells .....	1003
<i>P. Holtappels, T. Graule, B. Gut, U. Vogt, L. Gauckler, M. Jörger, D. Perednis, K. Honegger, G. Robert, S. Rambert and A. J. McEvoy</i>	
Fabrication of Anode Supported Electrolyte with CeScSZ Electrolyte and NiO-CeScSZ Anode by EPD Technique.....	1011
<i>Katsuhiko Yamaji, Haruo Kishimoto, Yeuping Xiong, Teruhisa Horita, Natsuko Sakai and Harumi Yokokawa</i>	
Fabrication and Characterization of Anode Supported Tubular SOFCs with Zirconia Based Electrolyte for Reduced Temperature Operation.....	1019
<i>T. L. Nguyen, T. Honda, T. Kato, M. Shiono, A. Kobayashi, K. Hosoda, Z. Cai and M. Dokiya</i>	
Fabrication and Characteristics of Anode-Supported Flat Tubular SOFC .....	1029
<i>Rak-Hyun Song, Jong-Hee Kim, Hui-Joung Son, Dong Ryul Shin and Harumi Yokokawa</i>	
Cathode Supported Thin Film SOFCs .....	1035
<i>Craig P. Jacobson, Steven J. Visco and Lutgard C. De Jonghe</i>	
Development of Low-Cost Alloy Supported SOFCs.....	1040
<i>Steven J. Visco, Craig P. Jacobson, Igor Villareal, Andy Leming, Yuriy Matus and Lutgard C. De Jonghe</i>	
Development of Thin-Film SOFC for Stationary and Mobile Application by Using Plasma Deposition Technology .....	1051
<i>Günter Schiller, Thomas Franco, Rudolf Henne, Michael Lang, Patric Szabo, O. Finkenwirth, B. Kuhn and F.-J. Wetzel</i>	

Electrochemical Characterisation of Vacuum Plasma Sprayed SOFCs on Different Porous Metallic Substrates .....	1059
<i>Michael Lang, Thomas Franco, Rudolf Henne, Patrick Metzger, Günter Schiller and Sebastian Ziehm</i>	
Patterned Series-Connected SOFC .....	1068
<i>Tammy Lai, Jiang Liu and Scott A. Barnett</i>	
Novel SOFC Tubular Design Configurations .....	1077
<i>Yanhai Du, Nigel M. Sammes and Ray England</i>	
Development of SOFCRoll .....	1082
<i>Fran G. E. Jones, Paul A. Connor and John T. S. Irvine</i>	
Low Cost Solid Oxide Fuel Cell Stack Design Using Extruded Honeycomb Technology.....	1090
<i>William Rauch, K. J. Lee, Joe Cochran and Meilin Liu</i>	
Comparison of Anode and Electrolyte Support Configuration of Single-Chamber SOFC .....	1101
<i>P. Jasinski, T. Suzuki, Z. Byars, F. Dogan and H. U. Anderson</i>	
Fabrication Methods of a Leaky SOFC Design .....	1109
<i>W. E. Windes, A. E. Erickson, P. A. Lessing, G. Huestis and E. Shaber</i>	
Fabrication and Performances of a Small SOFC Stack Using Doped Lanthanum Gallate Electrolyte.....	1119
<i>Yanhai Du and Nigel M. Sammes</i>	
Experimental Requirements in Determination of SOFC Electrode Kinetics .....	1126
<i>Mogens Mogensen and Peter Vang Hendriksen</i>	
In-Situ Characterization of Electrode Reactions in Solid Oxide Fuel Cells .....	1132
<i>Meilin Liu, Xinyu Lu and Peter Faguy</i>	
Breakdown of Losses in Thin Electrolyte SOFCs .....	1147
<i>P. V. Hendriksen, S. Koch, M. Mogensen, Y. L. Liu and P. H. Larsen</i>	
Long-Term Tests of DK-SOFC Cells .....	1158
<i>R. Barfod, S. Koch, Y.-L. Liu, P. H. Larsen and P. V. Hendriksen</i>	
SOFC Single Cell Test Setup for the Use of Various Hydrocarbons.....	1167
<i>Daniel Fouquet, Daniel Klotz, Eric Dannhäuser, Axel C. Müller, André Weber and Ellen Ivers-Tiffée</i>	

Direct Methane Oxidation in Micro-Tubular SOFCs Using Doped LaGaO <sub>3</sub> Electrolyte .....	1170
<i>Venkataramanan Mandakolathur, Yanhai Du and Nigel Sammes</i>	
Electrochemical Impedance Characteristics of Some Medium Temperature Semicells for SOFC.....	1176
<i>E. Lust, G. Nurk, P. Möller, I. Kivi, S. Kallip, A. Jänes, V. Sammelselg and H. Mändar</i>	
Impedance Measurement and Simulation on a Disc-Type SOFC Under Power Generation .....	1186
<i>A. Momma, T. Kato, K. Nozaki, A. Negishi, K. Kato, Y. Kaga, S. Nagata, K. Takano, T. Inagaki, H. Yoshida, K. Hosoi, K. Hoshino, T. Akbay and J. Akikusa</i>	
Study on an Efficient and Flexible SOFC System .....	1200
<i>Harumi Yokokawa, Katsuhiko Yamaji, Teruhisa Horita, Yue Ping Xiong, Natsuko Sakai, Ellen Ivers-Tiffée, André Weber, Axel C. Müller, Daniel Fouquet, Koichi Eguchi, Tatsuya Takeguchi, Ryuji Kikuchi, Truls Norby and Reidar Haugsrud</i>	
Collaboration Platform for Research and Development of Solid Oxide Fuel Cells .....	1210
<i>M. Koyama, S. B. Kraines, Y. Tamura and Y. Fukushima</i>	

## SOFC FUELS

Equilibria in Fuel Cell Gases .....	1225
<i>K. Sasaki and Y. Teraoka</i>	
Thermodynamic Analysis of Diesel Reforming Options for SOFC Systems.....	1240
<i>Khaliq Ahmed and Karl Föger</i>	
Cool Flame Evaporation for Diesel Reforming Technology .....	1250
<i>Lutz Hartmann, Christian Mengel, Klaus Lucka and Heinrich Köhne</i>	
Partial Oxidation Reforming of Dry Diesel Oil, Dimethyl-Ether and Methane Using SOFC .....	1260
<i>Masayuki Dokiya, Masaaki Ubukata, Takuya Kikuchi, Lan Tuong Nguyen, Toru Kato and Iwao Anzai</i>	
Power Generating Property of Direct Dimethyl Ether SOFC Using LaGaO <sub>3</sub> -Based Perovskite Electrolyte.....	1266
<i>Akio Tatemi, Shizhong Wang, Tatsumi Ishihara, Hiroyasu Nishiguchi and Yusaku Takita</i>	

Propane Fuel Processing for SOFC Systems .....	1276
<i>Jason Devitt, Jijun Xu, Coral Lukaniuk, Glenn Price and Mike Staite</i>	
Propane Fueled Solid Oxide Fuel Cells .....	1286
<i>Zhongliang Zhan, Brian D. Madsen, Jiang Liu and Scott A. Barnett</i>	
Power Generation Characteristics of SOFCs for Alcohols and Hydrocarbon-Based Fuels .....	1295
<i>K. Sasaki, K. Watanabe, K. Shiosaki, K. Susuki and Y. Teraoka</i>	
Formulating Liquid Hydrocarbon Fuels for SOFCs .....	1305
<i>Gary J. Saunders and Kevin Kendall</i>	

### **CELL, STACK AND SYSTEM MODELING** **(INCLUDING MECHANICAL EFFECTS)**

Modeling of the Potential Jump at Electrode-Electrolyte Interface Using Singularity Distribution.....	1317
<i>Ismail B. Celik, Suryanarayana R. Pakalapati and R. S. Gemmen</i>	
Analytical and FEM-Modeling Approach for a 3-Dimensional Cathode/Solid Electrolyte Interface .....	1330
<i>Dirk Herbstritt, Axel C. Müller, André Weber and Ellen Ivers-Tiffée</i>	
First Steps of a Cell Model Centered on the Direct Internal Reforming at the Anode .....	1338
<i>B. Morel, J. Deseure, Y. Bultel, F. Lefebvre-Joud and J. Fouletier</i>	
Modeling of Anode-Supported SOFCs Operating with H <sub>2</sub> and CO Feed Mixtures .....	1348
<i>Rapeepong Suwanwarangkul, Eric Croiset, Michael W. Fowler, Peter L. Douglas, Evgeniy Entchev and Mark A. Douglas</i>	
Control Theory Based Models for Dynamic SOFC Operations .....	1358
<i>Albert Krügel, Sven Schäfer, Klaus Schmid, Andre Weber and Ellen Ivers-Tiffée</i>	
Verification of Control Theory Based Models for Dynamic SOFC Operations .....	1368
<i>Sven Schäfer, Klaus Schmid, Albert Krügel, André Weber and Ellen Ivers-Tiffée</i>	
SOFC Modeling and Simulation Under the U. S. DOE SECA Core Technology Program.....	1378
<i>William A. Rogers, Donald Collins, Mohammad A. Khaleel and Edgar Lara-Curzio</i>	

A Computational Fluid Dynamics Model of a SOFC .....	1395
<i>Kaokanya Sudaprasert, Rowland P. Travis and Ricardo F. Martinez-Botas</i>	
Computational Fluid Dynamics Modeling of Solid Oxide Fuel Cells .....	1403
<i>Ugur Pasaogullari and Chao-Yang Wang</i>	
Evaluation of Electrode Performance Using a Microstructure-Based Simulation Model .....	1413
<i>D. R. Rector and M. A. Khaleel</i>	
Investigation and Modeling of the Flow Field in SOFC .....	1425
<i>Xiaofeng Yan and Nicola Bunschuh</i>	
Complete Modeling of kW-Range SOFC Stacks .....	1436
<i>Andreas Gubner, Dieter Froning, Bert de Haart and Detlef Stolten</i>	
Simulation of a 220 kW Hybrid SOFC Gas Turbine System and Data Comparison .....	1442
<i>Yaofan Yi, Thomas P. Smith, Jacob Brouwer, Ashok D. Rao and G. Scott Samuelsen</i>	
Issues Affecting the Mechanical Integrity of SOFCs .....	1455
<i>Samuel T. Hagos and Rowland P. Travis</i>	
Strength of Planar Cells for SOFC Application .....	1463
<i>J. Malzbender, R. W. Steinbrech and L. Singheiser</i>	
Stress Analysis for an Operating SOFC Stack .....	1473
<i>Mark Boersma, Bryce Sharman and Mehrzad Tabatabaian</i>	
Modeling of Cross-Flow Stack: Sensitivity to Thermal Properties of the Materials .....	1478
<i>D. Larrain, J. Van herle, M. Graetzel and D. Favrat</i>	
Cell to Cell Performance Variations Within a Stack .....	1487
<i>A. C. Burt, I. B. Celik, R. S. Gemmen and A. V. Smirnov</i>	
Failure Prediction and Prevention by Knowledge Management in Solid Oxide Fuel Cell Design .....	1501
<i>Y. Tamura, M. Koyama and S. B. Kraines</i>	
Subject Index .....	1513
Author Index .....	1515