T3: Fuel Cells

To Use this Index: Scroll down or use the bookmarks in the left-hand frame to move to a new location in this index. Click on a blue paper title to view that paper. To return to this index after viewing a paper, click the PREVIOUS MENU bookmark in the left frame.

Session 13 - Catalytic Hydrogen Generation for Fuel Cell Applications I
Chair: Maria Flytzani-Stephanopoulos
Vice Chair: Dragomir B Bukur

13b Stability of Gold-Ceria Catalysts in the Water-gas Shift and Selective CO Oxidation Reactions
Weiling Deng, Qi Fu, Janice DeJesus and Maria Flytzani-Stephanopoulos

13c Microkinetic analysis of water-promoted CO oxidation, water-gas shift, and preferential oxidation of CO on Pt for hydrogen generation
Ashish B. Mhadeshwar and Dionisios G. Vlachos

Session 14 - Fuel Cell Technology I
Chair: Godwin Igwe
Vice Chair: Ioannis (Yannis) P Androulakis

14g In-Situ Assessment of PEM Fuel Cells via AC Impedance at Operational Loads
Wenhua H. Zhu, Robert U. Payne, Donald R. Cahela and Bruce J. Tatarchuk

14h Measurement of Gas Dispersion in the Anode Feed Stream of a 47 Cell PEM Stack
Robert U. Payne, Wenhua H. Zhu, Dwight E. Cahela, and Bruce J. Tatarchuk

14i H2 Production from Partial Oxidation of iso-Octane over Ni/Ce0.75Zr0.25O2 and Ni/ßfl-Al2O3 Catalysts
Sitthiphong Pengpanich, Vissanu Meeyoo, Thirasak Rirksomboon and Johannes Schwank

Session 15 - Catalytic Hydrogen Generation for Fuel Cell Applications II
Chair: Maria Flytzani-Stephanopoulos
Vice Chair: Dragomir B Bukur

15d Bimetallic Carbide Catalysts for Methane Reforming
Huifeng Shao, Wenping Ma, Edwin L. Kugler and Dady B. Dadyburjor

15e Application of Combined Catalyst/Sorbent on Hydrogen Generation from Biomass Gasification
J. A. Satrio, B. H. Shanks and T. D. Wheelock

Session 16 - Fuel Cell Technology III
Chair: Susan Williams

16b Autothermal Reforming Catalysts For Use In Fuel Processors For Automotive And Stationary H2 Production
Magali Ferrandon, James Ralph, Theodore Krause

16c High Purity Hydrogen From Coal in a Single Step
Kanchan Mondal, Lubor Stonawski, Krzystoff Piotrowski, Tomasz Szymanski, Tomasz Wiltowski

Session 17 - Topics in Fuel Cell Technology
Chair: Ravindra Datta
Vice Chair: Tom R Marrero

17a Effects of Alumina Phase and Loading Amount on Catalytic Methane Combustion Activity of Pd- and Pt-Based Catalysts
Kraikul, N. and Jitkarnka, S.
### Session 18 - Novel Electrochemistry and Materials for Fuel Cells I

**Chair:** Michael J Antal  
**Vice Chair:** Richard Rocheleau

| Session 18a | Study of Gas Diffusion Layers in PEM Fuel Cells  
| Karuna S. Koppula, Michael C. Johnston and Virendra K. Mathur |
| Session 18b | Novel inorganic/organic hybrid membranes for proton exchange  
| Zhiwei Yang, Decio Coutinho, Duck Joo Yang, John P. Ferraris and Kenneth J. Balkus Jr. |

### Session 19 - Fuel Cell Technology: Fuel Processing I

**Chair:** Michael P Harold  
**Vice Chair:** Galen J Suppes

| Session 19d | Fuel Processing for PEM Fuel Cells: In-Line Adsorbent Filters forMEA Protection  
| Bong-Kyu Chang, Mukund Karanjikar, Yong Lu, Donald R. Cahela and Bruce J. Tatarchuk |
| Session 19e | Copper and Lanthanum Doped Cerium Oxide for Hot Reformate Gas Desulfurization  
| Zheng Wang, Mann Sakbodin, Scott West and Maria Flytzani-Stephanopoulos |

### Session 20 - Novel Electrochemistry and Materials for Fuel Cells II

**Chair:** Michael J Antal  
**Vice Chair:** Richard Rocheleau

| Session 20a | Development of Liquid Fuel Reformer Using Low Energy Pulse (LEP) Discharge at Room Temperature  
| Yasushi Sekine, Masahiko Matsukata, Eiichi Kikuchi and Shigeru Kado |
| Session 20b | Investigation of Fuel Cell Anode at Higher Temperature with Reformate Fuel by AC Impedance Spectroscopy  
| Ruichun Jiang, H. Russell Kunz and James M. Fenton |
| Session 20c | System under Investigation  
| Alexander Mukasyan |
| Session 20f | Synthesis of Novel Proton Conducting Mesoporous Silica (Ms) Films for High Temperature PEM Fuel Cells  

### Session 21 - Poster Session: Fuel Cell Technology

**Chair:** Tom R Marrero  
**Vice Chair:** Galen J Suppes

| Session 21a | Development of Simultaneous Measurement of Water Vapor Adsorption and Proton Conductivity to PEM for PEFC  
| Masayuki Yoshida |
| Session 21d | Natural Gas Odorants Desulfurization  
| Dushyant Shekhawat, Todd H. Gardner and David A. Berry |
| Session 21f | An Improved PEMFC Model with Plug Flow in Channels  
| Valeri A. Danilov, Il Moon and Jong-Koo Lim and Kyoung Hwan Choi |
| Session 21g | Partial Oxidation of n-Tetradecane over Lanthanum Ni-Hexaaluminate  
| Todd H. Gardner, Dushyant Shekhawat, David A. Berry and Maria D. Salazar-Villapando and Edwin L. Kugler |
Session 22 - Environmental Impact of Fuel Cell Technology  
Chair: Tapas K Das  
Vice Chair: Robert W Peters

22a Environmental Impact of Fuel Cell Technology for Electric Power Generation: An Overview and Case Studies  
Jaimini Upadhyaya, Robert W. Peters, Fouad H. Fouad, Rajesh K. Ahluwalia, Ezzat Danial Doss, Tapas Das

22b Performance of a Ford F-150 Using Various Fuel Blends of Compressed Natural Gas and Hydrogen  
Samrat Dutta, Robert W. Peters, Fouad H. Fouad, Henry Ng and Michael Duoba

22f Heat and Power Integration Opportunities in Methane Reforming based Hydrogen Production with PSA separation  
Alberto Posada and Vasilios Manousiouthakis

Session 23 - Fuel Processing Session I: Modeling and System Integration  
Chair: Ioannis (Yannis) P Androulakis  
Vice Chair: Urmila Diwekar

23a Dynamic Modeling and Analysis of PEM Fuel Cells for Startup from Subfreezing Temperatures  
Mallika Gummalla, Nikunj Gupta, Shubhro Ghosh, Sergei Burlatsky, Patrick Hagans and Cynthia Rice

23b Dynamic Modelling for Control of Fuel Cells  
Federico Zenith and Sigurd Skogestad

23d A Breakthrough Process for the Production of Hydrogen  
Frank Hershkowitz, Paul J. Berlowitz, Harry W. Deckman, Elise Marucchi-Soos, Chris S. Gurciullo, Jeffrey W. Frederick, Nick Rados and Rajeev Agnihotri

23g Integrated Framework for Fuel Cell Based Auxiliary Power Units: from Fuel Processing and System Performance, to Health, Ecological Impacts and Life Cycle Analysis  
Francesco Baratto, Urmila M. Diwekar

Session 24 - Fuel Processing Session II: Catalysis and Kinetics  
Chair: Ravindra Datta  
Vice Chair: Susan M Stagg-Williams

24a Water gas shift activity of noble metals and promoted noble metals supported on ceria-zirconia oxides  

24d High-Temperature Water-Gas Shift Reaction over Cr-Free Fe-Al Catalysts Promoted with First Row Transition Metals  
Sittichai Natesakhawat, Xueqin Wang and Umit S. Ozkan

24e Fuel Processing Session II: Catalysis and Kinetics: Characterization of PROX Catalysts on Structured Supports  
Paul Chin, George W. Roberts, Xiaolei Sun, and James J. Spivey

24f Selective CO Oxidation over Au Supported On Mixed Oxides: Effect of Preparation on Activity and Selectivity  
Abhishek Jain and Susan M. Stagg-Williams

24g Microfibrous Entrapment of Small Catalyst Particulates for High Contacting Efficiency Removal of Trace Co from Reformates at Low Temperatures for Pem Fuel Cells  
Bong-Kyu Chang and Bruce J. Tatarchuk
Session 25 - Fuel Processing Session III: Reactor Development and Modeling
Chair: Yushan Yan
Vice Chair: Urmila Diwekar

25c A Reformer Performance Model for Fuel Cell Applications
S.S. Sandhu, Y.A. Saif and J.P. Fellner

Session 26 - Fuel Cell Technology: Systems
Chair: Maria Flytzani-Stephanopoulos
Vice Chair: Levi T Thompson

26a Man-Portable Power Generation Based on Fuel-Cell Systems
Alexander Mitsos, Michael M. Hencke and Paul I. Barton

26d Systematic Optimization of a H2 PEMFC Power Generation System with Heat Integration
Cong Xu, Lorenz T. Biegler and Myung S. Jhon

26e Modeling, Simulation and Optimization of a Cross Flow Molten Carbonate Fuel Cell
P. Heidebrecht, M. Mangold, M. Gundermann, A. Kienle, K. Sundmacher

26f Hydrogen Production from Water using Polymer Electrolyte Membrane
Chang-Hee Kim, Kyu-Sung Sim and Ki-Bae Park

Session 181 - Interfacial and Electrochemical Phenomena in Microfluidics and MEMS I
Chair: Sammy S Datwani
Vice Chair: Carlton F Brooks

181c Asymmetric-Polarization AC Electroosmotic Micropump
Jie Wu and Hsueh-Chia Chang

181d The Energy Equation in Microchemical Systems
Khaled A. Alfadhel and Mayuresh. V. Kothare

181e Homogenization of Drop Stain by Radial Electroosmotic Flow in an Evaporating Drop
Sung Jae Kim, Kwan Hyoung Kang, In Seok Kang and Byung Jun Yoon

Session 182 - Interfacial and Electrochemical Phenomena in Microfluidics and MEMS II
Chair: Sammy S Datwani
Vice Chair: Carlton F Brooks

182h Computational Analysis of Microfluidic Biofuel Cells
A.S. Bedekar, J.J. Feng, K. Lim, S. Krishnamoorthy, G.T.R. Palmore and S. Sundaram

Session 513 - Fuel Cell Tutorial - Frontier's Session *
Chair: Trung V Nguyen
Vice Chair: Ravindra Datta

Session 514 - Fuel Cell Technology II
Chair: Trung V Nguyen
Vice Chair: Hossein Hariri

514b Operation of a PEM Stack with High Impurity Anode Feeds in a Recycle Mode
Wenhua H. Zhu, Robert U. Payne, Yong Lu, Bruce J. Tatarchuk

514e Model-based Control of Fuel Cells: Optimal Efficiency
J. Golbert and D.R. Lewin

514f Rigorous modeling and experimental validation of mass, charge and energy transport in a DMFC polymer electrolyte membrane
Thorsten Schultz, Kai Sundmacher
The electrochemical kinetics study of methanol at electrocatalyst Pt-Ru/C and the methanol diffusion in the modified proton exchange membranes  
Ning-Yih Hsu, Yu-Nong Chen, Shi-Chern Yen

Direct Methanol Fuel Cell Thermodynamic Simulation  
S.S. Sandhu, R.O. Crowther, J.P. Fellner

Session 515 - Fuel Cells KEYNOTE PRESENTATIONS SESSION  
Chair: Galen J Suppes  
Vice Chair: Ken S Chen

The Federal Role in Fuel-cell Research and Development  
Geoffrey Prentice

Direct Fuel Cell Power Plants for Distributed Generation  
H. C. Maru

Session 518 - Fuel Cell Technology: Fuel Processing II  
Chair: Michael P Harold  
Vice Chair: Tom R Marrero

Development of Reaction Kinetics for Diesel-Based Fuel Cell Reformers  
David A. Berry, Dushyant Shekhawat and Todd H. Gardner

High Pressure Fuel Processing in Regenerative Fuel Cells  
G. J. Suppes, J. F. White, Kiran Yerrakondreedygari

* These papers were unavailable at the time of publication.