

## T3: Fuel Cells

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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*

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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            [H<sub>2</sub> Production from Partial Oxidation of iso-Octane over Ni/Ce<sub>0.75</sub>Zr<sub>0.25</sub>O<sub>2</sub> and Ni/βfl-Al<sub>2</sub>O<sub>3</sub> Catalysts](#)  
*Sitthiphong Pengpanich, Vissanu Meeyoo, Thirasak Rirksomboon and Johannes Schwank*

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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*

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*Magali Ferrandon, James Ralph, Theodore Krause*
- 16c            [High Purity Hydrogen From Coal in a Single Step](#)  
*Kanchan Mondal, Lubor Stonawski, Krzysztof Piotrowski, Tomasz Szymanski, Tomasz Wiltowski*

### Session 17 - Topics in Fuel Cell Technology

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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.*

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Vice Chair: Richard Rocheleau

- 18a            [Study of Gas Diffusion Layers in Pem Fuel Cells](#)  
*Karuna S. Koppula, Michael C. Johnston and Virendra K. Mathur*
- 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

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

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- 20a            [Development of Liquid Fuel Reformer Using Low Energy Pulse \(LEP\) Discharge at Room Temperature](#)  
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- 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*
- 20c            [System under Investigation](#)  
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*Fangxia Feng, Zhiwei Yang, Decio H. Coutinho, John P. Ferraris and Kenneth J. Balkus, Jr.*

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*Masayuki Yoshida*
- 21d            [Natural Gas Odorants Desulfurization](#)  
*Dushyant Shekhawat, Todd H. Gardner and David A. Berry*
- 21f            [An Improved Pemfc Model with Plug Flow in Channels](#)  
*Valeri A. Danilov, Il Moon and Jong-Koo Lim and Kyoung Hwan Choi*
- 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*

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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](#)  
*Rakesh Radhakrishnan, R.R. Willigan, C.A. Newman, Y. She, F. Feng, F. Wijzen, X. Tang, S.M. Opalka, H. Cordatos, Z. Dardas, T.H. Vanderspurt*
- 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 [Microfibrinous Entrapment of Small Catalyst Particulates for High Contacting Efficiency Removal of Trace Co from Reformates at Low Temperatures for Pem Fuel Cells](#)  
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## 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

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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 H<sub>2</sub> 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*

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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*

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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](#)  
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- 514f [Rigorous modeling and experimental validation of mass, charge and energy transport in a DMFC polymer electrolyte membrane](#)  
*Thorsten Schultz, Kai Sundmacher*

514g [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*

514h [Direct Methanol Fuel Cell Thermodynamic Simulation](#)  
*S.S. Sandhu, R.O. Crowther, J.P. Fellner*

### **Session 515 - Fuel Cells KEYNOTE PRESENTATIONS SESSION**

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Vice Chair: Ken S Chen

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*Geoffrey Prentice*

515b [Direct Fuel Cell Power Plants for Distributed Generation](#)  
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### **Session 518 - Fuel Cell Technology: Fuel Processing II**

Chair: Michael P Harold

Vice Chair: Tom R Marrero

518b [Development of Reaction Kinetics for Diesel-Based Fuel Cell Reformers](#)  
*David A. Berry, Dushyant Shekhawat and Todd H. Gardner*

518g [High Pressure Fuel Processing in Regenerative Fuel Cells](#)  
*G. J. Suppes, J. F. White, Kiran Yerrakondreddygari*

\* These papers were unavailable at the time of publication.