

ICH2P-09

INTERNATIONAL CONFERENCE ON HYDROGEN PRODUCTION-2009

May 3 – 6, 2009
University of Ontario Institute of Technology
Oshawa, Ontario, Canada



FINAL PROGRAM

Sponsored by:

- University of Ontario Institute of Technology
- Durham Strategic Energy Alliance
- Ontario Centres of Excellence
- Air Liquide
- Ontario Power Generation (OPG)
- Regional Municipality of Durham

Organized by:

- University of Ontario Institute of Technology
- University of Waterloo
- International Hydrogen Energy Association (IHEA)

SUNDAY MAY 3, 2009	
Time	Location: UA East Atrium
15:00 – 19:00	Registration

MONDAY MAY 4, 2009			
Time	Room A (UA 1350)	Room B (UA 1220)	Room C (UA 1240)
8:30am	<u>Opening Remarks:</u> I. Dincer, G. Naterer (ICH2P co-chairs); R. Marceau (Acting Dean, Provost, UOIT); R. Bordessa (President, UOIT); J. Gray (Mayor, City of Oshawa)		
9:00am	<u>Keynote Lecture:</u> Saga of Hydrogen Civilization, T.N. Veziroglu		
9:40am	<u>Keynote Lecture:</u> Ensuring Sustainable Energy Security and Supply: The Role of Nuclear Energy in Canada, R.B. Duffey		
10:20am-10:40am	Refreshment Break		

10:40am-12:30pm (110 min)		Session 1-A: Hydrogen aspects and Steam reforming, Chair: D.B. Levin	Session 1-B: Nuclear based hydrogen production, Chair: R.B. Duffey
		Invited: 157- Liquid Hydrogen: Back to Basics, S.A. Sherif	170-Recent Canadian Advances in Nuclear Based Hydrogen Production and the Thermochemical Cu-Cl Cycle, G. Naterer
		30- Hydrogen Production from Ethanol Steam Reforming on Cerium/Nickel Based Oxyhydrides, L. J. Duhamel, C. Pirez, M. Capron, F. Dumeignil, E. Payen	79-High-Temperature Electrolysis for Large-Scale Hydrogen and Syngas Production from Nuclear Energy – System Simulation and Economics, J. Obrien, M. Mckellar, E. A. Harvego, C. M. Stoots
		76- Hydrogen Production from Raw Bioethanol Steam Reforming: Optimization, A. Le Valant, F. Can, N. Bion, F. Epron, D. Duprez	42- Comparison of Sulfur-Iodine and Copper-Chlorine Thermochemical Hydrogen Production Cycles, Z. Wang, G.F. Naterer, K.S. Gabriel, R. Gravelsins, V. Daggupati
		7- Production of Hydrogen by Solar Energy Powered Supercritical Cycle Using Carbon Dioxide, X. R. Zhang, H. Yamaguchi, Y. Cao	24- Importance of Hydrogen Fuels as Sustainable Alternative Energy for Domestic and Industrial Applications, H.R. Sharifan, N. B. Davari
12:30pm-2:00pm	Lunch Break		
2:00pm-3:40pm (100 min)		Panel Session 2-A: Hydrogen perspectives from government and industry, Chair: T. Kimmel	Specialized Session 2-B: : Solar Hydrogen Production Systems , Chair: P.J. Sebastian
		<u>Invited Talks:</u> 1) NSERC's Research and Industrial Community: A Growing Force of Discovery, People and Innovation Shaping Tomorrow's Hydrogen Economy, R. Therrien	Invited: 152-Development and Characterization of a Solar-Hydrogen Energy System, P.J. Sebastian
		2) Industry perspectives of current hydrogen markets, P. Gauthier	65-Solar Regenerative Fuel Cell System for High Altitude Airships, R. Kota, R. Kota, S. T. Revankar
		3) Canada's Hydrogen Energy Sector, T.B. Kimmel	81-Solar Hydrogen Hybrid System with Carbon Storage, G. Zini, R. Marazzi, P. Tartarini
	4) Support of Hydrogen Programs by the Ontario Centres of Excellence, R. Stasko	133-Assessment of Solar Hydrogen Production Methods, A. Joshi, I. Dincer, B.V. Reddy	
3:40pm-4:00pm	Refreshment Break		

4:00pm- 5:40pm (100 min)		Session 3-A: Thermochemical copper-chlorine cycle I, Chair: P. Tremaine	Specialized Session 3-B: Novel Hydrogen Storage Technologies, Chair: I.P. Jain
		111-Development of the Electrolysis Reactions involved in the Cu-Cl Thermochemical Cycles, L. Stolberg, H. Boniface, S. McMahon, S. Suppiah, S. York	Invited: 82- Hydrogen Storage in Mg: A Most Promising Material, I.P. Jain
		70- An Overview of the R&D Activities for the Cu-Cl Cycle, M. A. Lewis, D. R. Tatterson	
		57- Decomposition Analysis of Cupric Chloride Hydrolysis in the Cu-Cl Cycle of Hydrogen, V. N. Daggupati, G. F. Naterer, K. S. Gabriel, R. Gravelins, Z. Wang	15- Hydrogen Nano-Storage in Metal Clusters: Low-Temperature Release Option, F. Naumkin
		106- Complexation in the Cu(II)-LiCl-H ₂ O System at Temperatures to 150 °C by UV-Vis Spectroscopy, L. Trevani, J. Ehlerova, J. Sedlbauer, P. R. Tremaine	61- Gas Desorption Properties of Ammonia Borane and Metal Hydride Composites, M. R. Matin
		75- Desorption of Hydrogen from MgH ₂ : In- Situ Electron Diffraction Study, B. Paik, I. P. Jones, A. Walton, V. Mann, D. Book, I. R. Harris	
6:30	Dinner Reception (UA East Atrium) and Hydrogen Production Laboratory Openhouse (UA 1420)		

TUESDAY MAY 5, 2009			
Time	Room A (UA 1350)	Room B (UA 1220)	Room C (UA 1240)
8:50am-9:35am	<u>Keynote Lecture:</u> We Don't Have an Energy Crisis – We Have an Energy Currency Crisis, D. S. Scott		
9:40am-11:00am (80 min)		Session 4-A: Thermochemical sulfur-iodine cycle, Chair: A. Miller	Specialized Session 4-B: Integrated systems using hydrogen energy, Chair: S.A. Sherif
		93-Degradation of Materials Under Conditions of the Sulfur-Iodine Thermochemical Cycle, H.Dole, S. Klimas, A. Miller, H. Searle, P. Yeung	Invited: 87-Solid Oxide Fuel Cells and Hydrogen Production, F. Dogan
		64-Aspen Simulation of the Sulfur Iodine Thermo-chemical Cycle, C. Kane, N. Brown, S. Revankar	
		66-Sulfur Based Thermochemical Cycle Coupled To Nuclear Heat Transport System, N. Brown, S. Revankar	161- Energy Analysis of a Trigeneration Plant Based on Solid Oxide Fuel Cell and Organic Rankine Cycle, F.A. Al-Sulaiman, I. Dincer, F. Hamdullahpur
		54- Parametric Study of Hydrogen Production from the Sulfur-Iodine Cycle in Fusion-Driven Systems, G. Özişik, N. Demir, S. Yalçın, N. Kahraman, H. Yapici	51-Comparative Heat Transfer Analysis of Gasoline And Hydrogen Fuelled Internal Combustion Engines, N.L. D'Souza, J. Nieminen, I. Dincer and Y. Yang
		39- Analysis of Ontario's Hydrogen Economy Demands from Hydrogen Fuel Cell Vehicles, H. Liu, M. Fowler, A. Elkamel	50-Exergy Analysis of a Hydrogen Powered Internal Combustion Engine, J. Nieminen, I. Dincer and Y. Yang
11:00am-11:20am	Refreshment Break		
11:20am-12:40pm (80 min)		Session 5-A: Thermochemical copper-chlorine cycle II, Chair: S. Lvov	Session 5-B: Gasification processes, Chair: A. Margaritis
		77- Development of CuCl(Aq)/Hcl(Aq) Electrolyzer for Hydrogen Production, Y. Gong, E. Chalkova, M. Fedkin, S. Lvov	20- Hydrogen Enriched Gas Production in a Multi-Stage Downdraft Gasification Process, A. Dutta, S. Jarungthammachote
		90- Thermophysical Properties of Copper Compounds in Copper-Chlorine Thermochemical Water Splitting Cycles, C. Zamfirescu, I. Dincer, G. Naterer	109-Coal Gasification: Is it Better to Produce Electricity or Hydrogen for Effective Downstream CO ₂ Capture?, N. Gnanapragasam, B. Reddy, M. Rosen
		56- Ceramic Carbon Electrode-Based Anodes for Use in the Cu-Cl Thermochemical Cycle, R. Santhanam, B. Easton	113-Effect of Gasification Agent on the Performance of Solid Oxide Fuel Cell and Biomass Gasification Systems, C. O. Colpan, F. Hamdullahpur, I. Dincer, Y. Yoo
		101-Effects of Varying Cupric Chloride Concentration on Aqueous Droplet Evaporation in the Cu-Cl Cycle, P. Bahadorani, G. F. Naterer, K. Gabriel	147- Effect of Nickel Loading on Hydrogen Production and Chemical Oxygen Demand (COD) Destruction from Glucose Oxidation and Gasification in Supercritical Water, E.A.E.A Youssef, M. B. I Chowdhury, G. Nakhla, P. Charpentier
12:40pm-2:00pm	Lunch		

2:00pm- 3:40pm (100 min)		Session 6-A: Electrolysis and fuel cells, Chair: F. Dogan	Panel Session 6-B: Emerging Technology of Plug-In Hybrid Electric Vehicles: Potential and Impact on the Hydrogen Economy, Chair: M. Fowler
		73- Transport Phenomena in the Cathode of a Molten Carbonate Fuel Cell, P. Berg, J. Findlay	<u>Invited Talks:</u>
		78-High-Temperature Electrolysis for Large-Scale Hydrogen Production from Nuclear Energy: Experimental Investigations, C. Stoots, J. O'brien, K. Condie, J. Hartvigsen	1) Canadians' Perceptions of EVT and Necessary Interventions to Move the Technology to Market, Rebecca Spring, Pollution Probe
		23- Solid Oxide Electrolyzers Cells for Hydrogen Production and Post Mortem Analysis of Cell Materials, D. Wiedenmann, A. Hauch, B. Grobéty, M. Mogensen, U.F. Vogt	2) Electrify the Vehicle Platform, Commercialization of PHEV to Fuel Cell Vehicles, Manager of Electrical and Controls Engineering, General Motors Canada
		58- PEM Water Electrolyzers: From Electrocatalysts To Stack Development, P. Millet, R. Ngameni, S.A. Grigoriev, N. Mbemba, F. Brisset, A. Ranjbari, C. Etiévant	3) Current Status of the Development of Key PHEV Technology – At the Leading Edge, John Standard, Enermotion
		155-A Reversible Electrolyzer-Fuel Cell System Based on PEM Technology, S.A. Grigoriev, P. Millet, V.N. Fateev	4) Electrical Grid Limitations for Potential Penetration for Hydrogen Fuel Cell Vehicles and PHEV With the Current Electrical Infrastructure in Ontario, M. Fowler
3:40pm- 4:00pm	Refreshment Break		
4:00pm- 5:40pm (100 min)		Session 7-A: Renewables and hydrogen production, Chair: P. Millet	Specialized Session 7-B: PEM Fuel Cells, Chair: X. Li
		29- Challenges for Renewable Hydrogen Production, D. B. Levin, R. Chahine, L.	<u>Invited Talks:</u>
		88-Potential Methods for Geothermal-Based Hydrogen Production, M.T. Balta, I. Dincer, A. Hepbasli	1) Water and Thermal Management in Polymer Electrolyte Membrane Fuel Cells, X. Li
		52- Low Temperature Hydrogen Production from Renewable Fuels, B. Reichman, W. Mays, J. Strebe, M. Fetcenko	2) Catalyst-Layers of PEM Fuel Cells: from Microstructure to Performance, Z.S. Liu
		21- Chemical Looping Gasification of Biomass: An Innovative Method of Hydrogen Enriched Gas Production with In-Process Carbon Dioxide Capture, B. Acharya, A. Dutta	123-Modelling of Ion and Water Transport in the Polymer Electrolyte of PEM Fuel Cells, J. J. Baschuk, X. Li
	126-Hydrogen Production from Biomass Gasification, A. Abuadala, I. Dincer, G. Naterer	124-Numerical Investigation of PEMFC Cold Start at Different Cell Conditions, K. Jiao, X. Li	
6:30	Bus Leaves South Residence Hall to Deer Creek Banquet Facility, Ajax, for Dinner Reception		

WEDNESDAY MAY 6, 2009

Time	Room A (UA 1350)	Room B (UA 1220)	Room C (UA 1240)
9:00am-10:40am (100 min)		Session 8-A: Thermochemical copper-chlorine cycle III, Chair: G.F. Naterer	Session 8-B: Hydrogen production and alternative vehicles, Chair: M.A. Rosen
		163- Thermodynamic Analysis of SCW NPP Cycles with Thermo-Chemical Co-Generation of Hydrogen, M.C. Naidin, S. Mokry, R. Monichan, K. Chopla, I. Pioro, G.F. Naterer, K. Gabriel	137- Effects of Alternative-Fuel Vehicles on Air Quality on Ontario, Canada, I. Kantor, A. Hajimiragha, M. Fowler, A. Elkamel
		91- Kinetics of the Hydrogen Production Reaction In A Copper-Chlorine Water Splitting Plant, C. Zamfirescu, I. Dincer, G. Naterer	32- Modelling Energy Demand for a Fleet of Hydrogen-Electric Vehicles Interacting with a Clean Energy Hub, F. Syed, M. Fowler, D. Wan, Y. Maniyali
		46- Iron Oxide (N- Fe ₂ O ₃) Nano-Wires and Carbon-Modified (Cm)-N-Fe ₂ O ₃ Thin Films for Water Splitting to Hydrogen and Oxygen Gas, M. Frites, Y. A. Shaban, S. U. M. Khan	164- Conversion of a Gasoline Internal Combustion Engine to Operate on Hydrogen Fuel, M. Bates, I. Dincer
		169-Reliability Assessment of a Hydrogen Reactor Unit of Copper-Chlorine Thermochemical Cycle, A.W. Al-Dabbagh, L. Lu	84- Feasibility of an Energy Conversion System in Canada Involving Large-Scale Integrated Hydrogen Production Using Solid Fuels, N. Gnanapragasam, B. Reddy, M. Rosen
		71- Conversion of Claus Plants of Kurkuk-Iraq to Produce Hydrogen and Sulfur, S.A. Naman, A. Veziroglu	150- Thermodynamic Analysis of Hydrogen Production from Biomass Gasification, M.K. Cohce, I. Dincer and M.A. Rosen
10:40am-11:00am	Refreshment Break		
11:00am-12:40pm (100 min)		Session 9-A: Biomass and biological hydrogen production, Chair: U.F. Vogt	Session 9-B: PEM fuel cells and membranes, Chair: X.R. Zhang
		28- Effect of Dilution and L-Malic Acid Addition on Bio-Hydrogen Production with <i>Rhodopseudomonas Palustris</i> from Effluent of an Acidogenic Anaerobic Reactor, N. Azbar, F. Tuba, C. Dokgoz	63- Experimental Study on The Effect of Cathode Flow Humidity and Temperature on the Performance of PEM Fuel Cell, R. El-Emam, M.M. Awad , A.M. Hamed, M. Tolba
		47-Fermentative Hydrogen Production by Diverse Microflora, B. Baghchehsaraee, G. Nakhla, D. Karamanev, A. Margaritis	40- Nanostructured Non-Precious Metal Catalyst for Oxygen Reduction Reaction in Polymer Electrolyte Membrane Fuel Cell, Z. Chen, P. Zelenay
		102- Exergetic Assessment of an Integrated Gasifier/Boiler System for Hydrogen Production with Different Biomass Types, Y. Kalinci, A. Hepbasli, I. Dincer	17- Modelling and Simulation of a PEM Fuel Cell Power System with a Fuzzy Logic Controller, A. Al-Dabbagh, L. Lu, A. Mazza
		117- An Integrated System for Hydrogen and Methane Production During Landfill Leachate Treatment, H. M. Hafez, G. Nakhla, H. El Naggar	59- Time and Frequency Domain Analysis of Hydrogen Permeation Across PdCu Metallic Membranes for Hydrogen Purification, C. Decaux, R. Ngameni, D. Solas, S. Grigoriev, P. Millet
		99-Hydrogen Production from Biomass by Biological Systems, H.R. Sharifan, S. Qader	118-Nafion/Zeolite Nanocomposite Membrane for High Temperature PEMFCs, Z. Chen
	End of Conference		