

RUU  
1-69/he



Volume 38

Issue 22

26 July 2013

ISSN 0360-3199

# International Journal of **HYDROGEN ENERGY**

Editor-in-Chief:

**Emre A. Veziroğlu**

Senior Associate Editor:

**J.W. Sheffield**

Associate Editors:

**A. Basile, M.B. Gorenssek,  
E.C. Kumbur, M.M. Mench,  
and N.Z. Muradov**

Assistant Editors:

**F. Chen, S.L. Garrison, J. Gong,  
M.D. Mat and D.P. Mishra**

includes SPECIAL SECTION

**ICFCHT 2011**

Guest Editor: Wan Ramli Wan Daud

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

**SciVerse ScienceDirect**



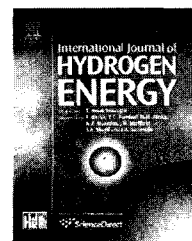


ELSEVIER

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

SciVerse ScienceDirect

International Journal of Hydrogen Energy 38 (2013) v–viii



[www.elsevier.com/locate/ijhydene](http://www.elsevier.com/locate/ijhydene)

## Contents

### Regular Articles

#### Electrolysis

X. WANG, Z.-G. SHAO, G. LI, L. ZHANG, Y. ZHAO, W. LU and B. YI 9057 Preparation and characterization of partial-cocrystallized catalyst-coated membrane for solid polymer electrolyte water electrolysis

X. CUI, G. JIANG, M. ZHU, Z. ZHAO, L. DU, Y. WENG, C. XU, D. ZHANG, Q. ZHANG, Y. WEI, A. DUAN, J. LIU and J. GAO 9065 TiO<sub>2</sub>/CdS composite hollow spheres with controlled synthesis of platinum on the internal wall for the efficient hydrogen evolution

#### Chemical/Thermochemical Hydrogen

S. DEGHANI and H. SAYYAADI 9074 Energy and exergetic evaluations of Bunsen section of the sulfur–iodine thermochemical hydrogen production plant

V.J. ASTON, B.W. EVANKO and A.W. WEIMER 9085 Investigation of novel mixed metal ferrites for pure H<sub>2</sub> and CO<sub>2</sub> production using chemical looping

#### Bio Hydrogen

K.-W. JUNG, S.-K. CHO, Y.-M. YUN, H.-S. SHIN and D.-H. KIM 9097 Rapid formation of hydrogen-producing granules in an up-flow anaerobic sludge blanket reactor coupled with high-rate recirculation

X. TANG, N. REN and J. XU 9104 Evaluation of hydrogen production from corn cob with the mesophilic bacterium *Clostridium hydrogeniproducens* HR-1

J. REN, A. FEDELE, M. MASON, A. MANZARDO and A. SCIPIONI 9111 Fuzzy Multi-actor Multi-criteria Decision Making for sustainability assessment of biomass-based technologies for hydrogen production

S.S. PAWAR, V.N. NKEMKA, A.A. ZEIDAN, M. MURTO and E.W.J. VAN NIEL 9121 Biohydrogen production from wheat straw hydrolysate using *Caldicellulosiruptor saccharolyticus* followed by biogas production in a two-step uncoupled process

C. ZHAO, W. LU and H. WANG 9131 Simultaneous hydrogen and ethanol production from a mixture of glucose and xylose using extreme thermophiles II: Effect of hydraulic retention time

R. JIN, Y. XU, G. LI, J. LIU and G. CHEN 9137 Hierarchical chlorophytum-like Bi<sub>2</sub>S<sub>3</sub> architectures with high electrochemical performance

#### Methanol Hydrogen

N. BUNDALESKA, D. TSYGANOV, R. SAAVEDRA, E. TATAROVA, F.M. DIAS and C.M. FERREIRA 9145 Hydrogen production from methanol reforming in microwave “tornado”-type plasma

#### Catalysts

E. BANIASADI, I. DINCER and G.F. NATERER 9158 Measured effects of light intensity and catalyst concentration on photocatalytic hydrogen and oxygen production with zinc sulfide suspensions

L. ZHANG, Z. XI, M. XING and J. ZHANG 9169 Effects of the preparation order of the ternary P25/GO/Pt hybrid photocatalysts on hydrogen production

- H. DANG, X. DONG, Y. DONG and J. HUANG 9178 Facile and green synthesis of titanate nanotube/graphene nanocomposites for photocatalytic H<sub>2</sub> generation from water
- A. KANTÜRK FIGEN 9186 Dehydrogenation characteristics of ammonia borane via boron-based catalysts (Co–B, Ni–B, Cu–B) under different hydrolysis conditions
- H.W. KANG, S.B. PARK and A.-H.A. PARK 9198 Effects of charge balance with Na<sup>+</sup> on SrTiO<sub>3</sub>:Mo<sup>6+</sup> prepared by spray pyrolysis for H<sub>2</sub> evolution under visible light irradiation
- W. LIU, H. CAI, P. LU, Q. XU, Y. ZHONGFU and J. DONG 9206 Polymer hydrogel supported Pd–Ni–B nanoclusters as robust catalysts for hydrogen production from hydrolysis of sodium borohydride
- F.-D. KONG, S. ZHANG, G.-P. YIN, J. LIU and Z.-Q. XU 9217 IrO<sub>2</sub>-graphene hybrid as an active oxygen evolution catalyst for water electrolysis

## Fossil Hydrogen

- P. GENTILLON and M. TOLEDO 9223 Hydrogen and syngas production from propane and polyethylene

## Storage

- J. RADAKOVIĆ, J. BELOŠEVIĆ-ČAVOR and V. KOTESKI 9229 Hydrogen storage in Laves phases: First principles study of electronic structure and formation energies in HfV<sub>2</sub> hydrides
- M. LI, F. YUAN, Q. GU and X. YU 9236 Synthesis and advanced dehydrogenation properties of niobium-based ammine borohydride
- C. ZHANG, Z. GENG, M. CAI, J. ZHANG, X. LIU, H. XIN and J. MA 9243 Microstructure regulation of super activated carbon from biomass source corncob with enhanced hydrogen uptake
- N.F. ATTIA, M.M. MENEMPARABATH, S. AREPALLI and K.E. GECKELER 9251 Inorganic nanotube composites based on polyaniline: Potential room-temperature hydrogen storage materials
- K. PARK, H.-S. LEE, A. REMHOF, Y.-S. LEE, Y. YAN, M.-Y. KIM, S.J. KIM, A. ZÜTTEL and Y.W. CHO 9263 Thermal properties of Y(BH<sub>4</sub>)<sub>3</sub> synthesized via two different methods
- A.H. WEISBERG, S.M. ACEVES, F. ESPINOSA-LOZA, E. LEDESMA-OROZCO, B. MYERS and B. SPENCER 9271 Cold hydrogen delivery in glass fiber composite pressure vessels: Analysis, manufacture and testing

## Membranes

- W. LU, Z.-G. SHAO, G. ZHANG, Y. ZHAO, J. LI and B. YI 9285 Preparation and characterization of imidazolium-functionalized poly (ether sulfone) as anion exchange membrane and ionomer for fuel cell application

## PE Fuel Cells

- A.R. KALIDINDI, R. TASPINAR, S. LITSTER and E.C. KUMBUR 9297 A two-phase model for studying the role of microporous layer and catalyst layer interface on polymer electrolyte fuel cell performance

## SO Fuel Cells

- C. LI, H. SHI, R. RAN, C. SU and Z. SHAO 9310 Thermal inkjet printing of thin-film electrolytes and buffering layers for solid oxide fuel cells with improved performance
- S.O. LEE, D. LEE, I. JUNG, D. KIM, S.-H. HYUN, J. KIM and J. MOON 9320 Ceria interlayer-free Ba<sub>0.5</sub>Sr<sub>0.5</sub>Co<sub>0.8</sub>Fe<sub>0.2</sub>O<sub>3-δ</sub>-Sc<sub>0.1</sub>Zr<sub>0.9</sub>O<sub>1.95</sub> composite cathode on zirconia based electrolyte for intermediate temperature solid oxide fuel cells

## Combustion

- S.I. LEE, D.H. UM and O.C. KWON 9330 Performance of a micro-thermophotovoltaic power system using an ammonia-hydrogen blend-fueled micro-emitter

## Properties

- D. HE, S. LI, X. LIU, C. ZHANG, Q. YU, Y. LEI, S. WANG and L. JIANG 9343 Influence of microstructure on the hydrogen permeation of alumina coatings

## Environmental Impact/Emissions

- Z. ZHANG, G. LIU and Y. MAO 9349 Improved separation efficiency of photogenerated carriers for  $\text{Fe}_2\text{O}_3/\text{SrTiO}_3$  heterojunction semiconductor
- J.-C. M'PEKO, D.L.S. REIS, J.E. DE SOUZA and A.R.L. CAIRES 9355 Evaluation of the dielectric properties of biodiesel fuels produced from different vegetable oil feedstocks through electrochemical impedance spectroscopy

## Special Section Papers

### ICFCHT2011

#### Guest Editor: Wan Ramli Wan Daud

- W.R.W. DAUD 9360 Editorial
- B.K. KAKATI, A. GHOSH and A. VERMA 9362 Efficient composite bipolar plate reinforced with carbon fiber and graphene for proton exchange membrane fuel cell
- W.Y. WONG, W.R.W. DAUD, A.B. MOHAMAD, A.A.H. KADHUM, K.S. LOH and E.H. MAJLAN 9370 Recent progress in nitrogen-doped carbon and its composites as electrocatalysts for fuel cell applications
- GH. MOHAMMADI, M. JAHANSHAHI and A. RAHIMPOUR 9387 Fabrication and evaluation of Nafion nanocomposite membrane based on  $\text{ZrO}_2\text{-TiO}_2$  binary nanoparticles as fuel cell MEA
- E. MISRAN, N.S. MAT HASSAN, W.R. WAN DAUD, E.H. MAJLAN and M.I. ROSLI 9395 Electrochemical properties of a PEMFC operating with saturated hydrogen and dry air
- E. MISRAN, N.S.M. HASSAN, W.R.W. DAUD, E.H. MAJLAN and M.I. ROSLI 9401 Water transport characteristics of a PEM fuel cell at various operating pressures and temperatures
- MULYAZMI, W.R.W. DAUD, E.H. MAJLAN and M.I. ROSLI 9409 Water balance for the design of a PEM fuel cell system
- W.Y. WONG, W.R.W. DAUD, A.B. MOHAMAD, A.A.H. KADHUM, K.S. LOH and E.H. MAJLAN 9421 Influence of nitrogen doping on carbon nanotubes towards the structure, composition and oxygen reduction reaction
- D. ROHENDI, E.H. MAJLAN, A.B. MOHAMAD, W.R. WAN DAUD, A.A. HASSAN KADHUM and L.K. SHYUAN 9431 Characterization of electrodes and performance tests on MEAs with varying platinum content and under various operational conditions
- M.Z.F. KAMARUDIN, S.K. KAMARUDIN, M.S. MASDAR and W.R.W. DAUD 9438 Review: Direct ethanol fuel cells
- J. THEPKAEW, S. THERDTHIANWONG, A. THERDTHIANWONG, A. KUCERNAK and N. WONGYAO 9454 Promotional roles of Ru and Sn in mesoporous PtRu and PtRuSn catalysts toward ethanol electrooxidation
- N. WONGYAO, A. THERDTHIANWONG, S. THERDTHIANWONG, S.M. SENTHIL KUMAR and K. SCOTT 9464 A comparison of direct methanol fuel cell degradation under different modes of operation
- H.S. THIAM, W.R.W. DAUD, S.K. KAMARUDIN, A.B. MOHAMAD, A.A.H. KADHUM, K.S. LOH and E.H. MAJLAN 9474 Nafion/Pd-SiO<sub>2</sub> nanofiber composite membranes for direct methanol fuel cell applications
- U.A. HASRAN, S.K. KAMARUDIN, W.R.W. DAUD, B.Y. MAJLIS, A.B. MOHAMAD, A.A.H. KADHUM and M.M. AHMAD 9484 Optimization of hot pressing parameters in membrane electrode assembly fabrication by response surface method

- P. TIWARI and S. BASU 9494 Ni infiltrated YSZ anode stabilization by inducing strong metal support interaction between nickel and titania in solid oxide fuel cell under accelerated testing
- M.R. SOMALU, V. YUFIT and N.P. BRANDON 9500 The effect of solids loading on the screen-printing and properties of nickel/scandia-stabilized-zirconia anodes for solid oxide fuel cells
- J.K. VERMA, A. VERMA and A.K. GHOSHAL 9511 Performance analysis of solid oxide fuel cell using reformed fuel
- S. BOULFRAD, M. CASSIDY, E. DJURADO, J.T.S. IRVINE and G. JABBOUR 9519 Pre-coating of LSCM perovskite with metal catalyst for scalable high performance anodes
- M. GHASEMI, W.R.W. DAUD, N. MOKHTARIAN, A. MAYAHI, M. ISMAIL, F. ANISI, M. SEDIGHI and J. ALAM 9525 The effect of nitric acid, ethylenediamine, and diethanolamine modified polyaniline nanoparticles anode electrode in a microbial fuel cell
- M. GHASEMI, W.R.W. DAUD, M. RAHIMNEJAD, M. REZAYI, A. FATEMI, Y. JAFARI, M.R. SOMALU and A. MANZOUR 9533 Copper-phthalocyanine and nickel nanoparticles as novel cathode catalysts in microbial fuel cells
- S.T. YONG, C.W. OOI, S.P. CHAI and X.S. WU 9541 Review of methanol reforming-Cu-based catalysts, surface reaction mechanisms, and reaction schemes
- T. HUSAINI, M. EDY HERIANTO, Y. ZAHIRA and W.D. WAN RAMLI 9553 PTFE-nafion membrane reactor for hydrogen production
- A. SURYAN, H.D. KIM and T. SETOGUCHI 9562 Comparative study of turbulence models performance for refueling of compressed hydrogen tanks
- B. SATYA SEK HAR, P. SURESH and P. MUTHUKUMAR 9570 Performance tests on metal hydride based hydrogen storage devices
- W.-F. MARK-LEE, K.-H. NG, L.J. MINGGU, A.A. UMAR and M.B. KASSIM 9578 A molybdenum dithiolene complex as a potential photosensitizer for photoelectrochemical cells
- K.H. NG, L.J. MINGGU and M.B. KASSIM 9585 Gallium-doped tungsten trioxide thin film photoelectrodes for photoelectrochemical water splitting
- P.S. CHONG, J.MD. JAHIM, S. HARUN, S.S. LIM, S.ABD. MUTALIB, O. HASSAN and M.T.M. NOR 9592 Enhancement of batch biohydrogen production from prehydrolysate of acid treated oil palm empty fruit bunch