

Volume 39

Issue 29

2 October 2014

ISSN 0360-3199

International Journal of **HYDROGEN ENERGY**

Editor-in-Chief:

Emre A. Veziroğlu

Senior Associate Editor:

J.W. Sheffield

Associate Editors:

**S.I. Allakhverdiev, A. Basile,
M.B. Gorenssek, E.C. Kumbur
and N.Z. Muradov**

Assistant Editors:

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

includes SPECIAL SECTION

ICAE 2013 – Symposium FC: Advanced Materials for Fuel Cell Technology

Guest Editors: Soo-Kil Kim, Haekyoung Kim, Jong Hyun Jang, Yong-Tae Kim,
Sung Jong Yoo, Oh Joong Kwon

Mexican Hydrogen Society Congress 2013

Guest Editors: Alejandro López Ortiz, Virginia Collins Martínez

Available online at www.sciencedirect.com

ScienceDirect



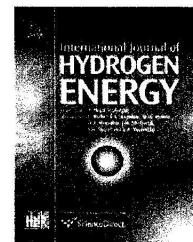


ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

International Journal of Hydrogen Energy 39 (2014) v–viii



www.elsevier.com/locate/ijhydene

Contents

Regular Articles

Electrolysis / Electrolyzers

- Y. KOBAYASHI, K. KOSAKA, T. YAMAMOTO, 16263 A solid polymer water electrolysis system utilizing natural circulation
Y. TACHIKAWA, K. ITO and K. SASAKI
- A.R. ZERADJANIN, A.A. TOPALOV, 16275 Sustainable generation of hydrogen using chemicals with regional
S. CHEREVKO and G.P. KEELEY oversupply – Feasibility of the electrolysis in acido-alkaline reactor

Solar Hydrogen

- P.K. DUBEY, P. TRIPATHI, R.S. TIWARI, 16282 Synthesis of reduced graphene oxide–TiO₂ nanoparticle composite systems
A.S.K. SINHA and O.N. SRIVASTAVA and its application in hydrogen production
- H. ZHOU, J. PAN, L. DING, Y. TANG, J. DING, 16293 Biomass-derived hierarchical porous CdS/M/TiO₂ (M = Au, Ag, Pt, Pd)
Q. GUO, T. FAN and D. ZHANG ternary heterojunctions for photocatalytic hydrogen evolution

Bio Hydrogen

- D.-H. KIM, S. JANG, Y.-M. YUN, M.-K. LEE, 16302 Effect of acid-pretreatment on hydrogen fermentation of food waste:
C. MOON, W.-S. KANG, S.-S. KWAK and Microbial community analysis by next generation sequencing
M.-S. KIM

Catalysts / Electrocatalysts

- L. DONG, J. ZANG, J. SU, Y. JIA, Y. WANG, 16310 Oxidized carbon/nano-SiC supported platinum nanoparticles as highly
J. LU and X. XU stable electrocatalyst for oxygen reduction reaction
- F. MESHKANI and M. REZAEI 16318 High temperature water gas shift reaction over promoted iron based catalysts
prepared by pyrolysis method
- J. KARUPPIAH and Y.S. MOK 16329 Plasma-reduced Ni/ γ -Al₂O₃ and CeO₂-Ni/ γ -Al₂O₃ catalysts for improving
dry reforming of propane

Storage

- M. GONDA, M. OHSHIMA, H. KUROKAWA, 16339 Toluene hydrogenation over Pd and Pt catalysts as a model hydrogen storage
and H. MIURA process using low grade hydrogen containing catalyst inhibitors
- Y.F. KHALIL 16347 Dust cloud combustion characterization of a mixture of LiBH₄ destabilized
with MgH₂ for reversible H₂ storage in mobile applications
- J. FU, M. TEGEL, B. KIEBACK and 16362 Dehydrogenation properties of doped LiAlH₄ compacts for hydrogen
L. RÖNTZSCH generator applications

Fuel Cells

- A. SCIAZKO, Y. KOMATSU, G. BRUS, 16372 A novel approach to improve the mathematical modelling of the internal
S. KIMIJIMA and J.S. SZMYD reforming process for solid oxide fuel cells using the orthogonal least
squares method
- M. BLANCO and D.P. WILKINSON 16390 Investigation of the effect of microporous layers on water management in a
proton exchange membrane fuel cell using novel diagnostic methods

- M.C. LOPES DE OLIVEIRA, I.J. SAYEG, G. ETT and R.A. ANTUNES 16405 Corrosion behavior of polyphenylene sulfide-carbon black-graphite composites for bipolar plates of polymer electrolyte membrane fuel cells
- B. XIAO, Y. HAN, X. LIU and J. LIU 16419 Relationship of methane and electricity production in two-chamber microbial fuel cell using sewage sludge as substrate

Aerospace Applications

- M. JANIĆ 16426 Greening commercial air transportation by using liquid hydrogen (LH₂) as a fuel

Properties

- J.-S. KIM and Y.-S. KIM 16442 Effect of thermal history on the terminal solid solubility of hydrogen in Zircaloy-4

Special Section: ICAE 2013 – Symposium FC: Advanced Materials for Fuel Cell Technology

Guest Editors: Soo-Kil Kim, Haekyoung Kim, Jong Hyun Jang, Yong-Tae Kim, Sung Jong Yoo, Oh Joong Kwon

- S.-K. KIM, H. KIM, J.H. JANG, Y.-T. KIM, S.J. YOO and O.J. KWON 16450 Preface to the special section ICAE 2013
- S. DALAI, S. VIJAYALAKSHMI, P. SHARMA and K.Y. CHOO 16451 Magnesium and iron loaded hollow glass microspheres (HGMs) for hydrogen storage
- S. PARK, H.J. KIM, C.W. LEE, H.J. SONG, S.S. SHIN, S.W. SEO, H.K. PARK, S. LEE, D.-W. KIM and K.S. HONG 16459 Sn self-doped α -Fe₂O₃ nanobranched arrays supported on a transparent, conductive SnO₂ trunk to improve photoelectrochemical water oxidation
- S.-Y. LEE, J.-M. PARK and S.-J. PARK 16468 Roles of nitric acid treatment on PtRu catalyst supported on graphite nanofibers and their methanol electro-oxidation behaviors
- T.-E. KIM, S.M. JUON, J.H. PARK, Y.-G. SHUL and K.Y. CHO 16474 Silicon carbide fiber-reinforced composite membrane for high-temperature and low-humidity polymer exchange membrane fuel cells
- S.H. LEE, Y.J. KWAK, H.R. PARK and M.Y. SONG 16486 Preparation and characterization of NbF₅-added Mg hydrogen storage alloy
- S. CHOI, Y. LIM, S. LEE, H. JANG, M.A. HOSSAIN, H. JOO, H. JU, T. HONG and W. KIM 16493 Studies of sulfonated polyphenylene containing fluorine moiety via nickel catalyzed C-C coupling polymerization
- B.-J. KIM and J.-S. KIM 16500 Hydrogen sensor using the Pd film supported on anodic aluminum oxide
- H.-Y. KIM, I. CHOI, S.H. AHN, S.J. HWANG, S.J. YOO, J. HAN, J. KIM, H. PARK, J.H. JANG and S.-K. KIM 16506 Analysis on the effect of operating conditions on electrochemical conversion of carbon dioxide to formic acid
- Y.M. PARK and H. KIM 16513 An additional layer in an anode support for internal reforming of methane for solid oxide fuel cells
- M.-H. HSU and C.-J. CHANG 16524 S-doped ZnO nanorods on stainless-steel wire mesh as immobilized hierarchical photocatalysts for photocatalytic H₂ production
- S.-H. SONG, S.-E. YOON, J. CHOI, B.-K. KIM and J.-S. PARK 16534 A high-performance ceramic composite anode for protonic ceramic fuel cells based on lanthanum strontium vanadate
- E.-K. LEE, H.H. CHUN and Y.-T. KIM 16541 Enhancing Ni anode performance via Gd₂O₃ addition in molten carbonate-type direct carbon fuel cell
- M.K. CHO, D.-N. LEE, Y.-Y. KIM, J. HAN, H.-J. KIM, E. CHO, T.-H. LIM, D. HENKENSMEIER, S.J. YOO, Y.-E. SUNG, S. PARK and J.H. JANG 16548 Analysis of the spatially distributed performance degradation of a polymer electrolyte membrane fuel cell stack

- M.-S. SHIN, Y.-J. BYUN, Y.-W. CHOI,
M.-S. KANG and J.-S. PARK 16556 On-site crosslinked quaternized poly(vinyl alcohol) as ionomer binder for solid alkaline fuel cells
- J.L. YIN and J.Y. PARK 16562 Electrochemical investigation of copper/nickel oxide composites for supercapacitor applications
- S.-H. LEE, H.-K. KIM, Y.-S. YUN, J.R. YOON,
S.-G. LEE and Y.-H. LEE 16569 A novel high-performance cylindrical hybrid supercapacitor with $\text{Li}_{4-x}\text{Na}_x\text{Ti}_5\text{O}_{12}$ /activated carbon electrodes
- M.G. JUNG, Y.J. KIM, Y.-G. JUNG and
H.-T. LIM 16576 Measurement of hydrogen and oxygen chemical potential in yttria doped barium cerate (BCY) electrolyte of anode-supported protonic ceramic fuel cells

Special Section: Mexican Hydrogen Society Congress 2013

Guest Editors: Alejandro López Ortiz, Virginia Collins Martínez

- A.L. ORTIZ and V.C. MARTÍNEZ 16585 Preface for the XIII-SMH International Congress Special Section

Hydrogen Production

- C. ESCAMILLA-ALVARADO,
M.T. PONCE-NOYOLA,
H.M. POGGI-VARALDO,
E. RÍOS-LEAL, J. GARCÍA-MENA and
N. RINDERKNECHT-SEIJAS 16587 Energy analysis of in-series biohydrogen and methane production from organic wastes
- D.Y. ACEVES OLIVAS,
M.R. BARAY GUERRERO,
M.A. ESCOBEDO BRETADO,
M. MARQUES DA SILVA PAULA,
J. SALINAS GUTIÉRREZ,
V. GUZMÁN VELDERRAIN, A. LÓPEZ ORTIZ
and V. COLLINS-MARTÍNEZ 16595 Enhanced ethanol steam reforming by CO_2 absorption using CaO , $\text{CaO}*\text{MgO}$ or Na_2ZrO_3
- J.L. CONTRERAS, C. TAPIA, G.A. FUENTES,
L. NUÑO, B. QUINTANA, J. SALMONES,
B. ZEIFERT and I. CÓRDOVA 16608 Equilibrium composition of ethanol steam reforming reaction to produce H_2 applied to Ni, Co and Pt/hydrotalcite- WO_x catalysts
- M.R.B. GUERRERO,
M. MARQUES DA SILVA PAULA,
M.M. ZARAGOZA, J.S. GUTIÉRREZ,
V.G. VELDERRAIN, A.L. ORTIZ and
V. COLLINS-MARTÍNEZ 16619 Thermogravimetric study on the pyrolysis kinetics of apple pomace as waste biomass
- R. SÁNCHEZ-DIRZO,
R.G. GONZÁLEZ-HUERTA, E. MENDOZA,
R. SILVA and J.M. SANDOVAL PINEDA 16628 From wave to jet and from jet to hydrogen: A promising hybrid system
- R. BARBOSA, B. ESCOBAR, V.M. SANCHEZ,
J. HERNANDEZ, R. ACOSTA and Y. VERDE 16637 Sizing of a solar/hydrogen system for high altitude long endurance aircrafts
- V.M. SANCHEZ, A.U. CHAVEZ-RAMIREZ,
S.M. DURON-TORRES, J. HERNANDEZ,
L.G. ARRIAGA and J.M. RAMIREZ 16646 Techno-economical optimization based on swarm intelligence algorithm for a stand-alone wind-photovoltaic-hydrogen power system at south-east region of Mexico
- A. LÓPEZ ORTIZ, M.A. ESCOBEDO BRETADO,
V. GUZMÁN VELDERRAIN,
M. MELÉNDEZ ZARAGOZA,
J. SALINAS GUTIÉRREZ,
D. LARDIZÁBAL GUTIÉRREZ and
V. COLLINS-MARTÍNEZ 16656 Experimental and modeling kinetic study of the CO_2 absorption by Li_4SiO_4

Fuel Cells

- A.L. VÁZQUEZ-LARIOS, O. SOLORZA-FERIA, H.M. POGGI-VARALDO, R. DE GUADALUPE GONZÁLEZ-HUERTA, M.T. PONCE-NOYOLA, E. RÍOS-LEAL and N. RINDERKNECHT-SEIJAS 16667 Bioelectricity production from municipal leachate in a microbial fuel cell: Effect of two cathodic catalysts
- D. GONZÁLEZ-QUIJANO, W.J. PECH-RODRÍGUEZ, J.I. ESCALANTE-GARCÍA, G. VARGAS-GUTIÉRREZ and F.J. RODRÍGUEZ-VARELA 16676 Electrocatalysts for ethanol and ethylene glycol oxidation reactions. Part I: Effects of the polyol synthesis conditions on the characteristics and catalytic activity of Pt–Sn/C anodes
- A. ALVAREZ, C. GUZMÁN, S. RIVAS, L.A. GODINEZ, A. SACCÀ, A. CARBONE, E. PASSALACQUA, L.G. ARRIAGA and J. LEDESMA-GARCÍA 16686 Composites membranes based on Nafion and PAMAM dendrimers for PEMFC applications
- J.M. SIERRA, S.J. FIGUEROA-RAMÍREZ, S.E. DÍAZ, J. VARGAS and P.J. SEBASTIAN 16694 Numerical evaluation of a PEM fuel cell with conventional flow fields adapted to tubular plates
- N.M. SÁNCHEZ-PADILLA, D. MORALES-ACOSTA, M.D. MORALES-ACOSTA, S.M. MONTEMAYOR and F.J. RODRÍGUEZ-VARELA 16706 Catalytic activity and selectivity for the ORR of rapidly synthesized M@Pt (M = Pd, Fe₃O₄, Ru) core–shell nanostructures
- K. SUAREZ-ALCANTARA, A. EZETA-MEJIA, M. ORTEGA-AVILÉS, D. HAASE, E. ARCE-ESTRADA, R.G. GONZALEZ-HUERTA, O. SOLORZA-FERIA and S.E. CANTON 16715 Synchrotron-based structural and spectroscopic studies of ball milled RuSeMo and RuSnMo particles as oxygen reduction electrocatalyst for PEM fuel cells
- C.A. CORTÉS-ESCOBEDO, R.G. GONZÁLEZ-HUERTA, A.M. BOLARÍN-MIRÓ, F. SÁNCHEZ DE JESÚS, Q. ZHU, S.E. CANTON, K. SUAREZ-ALCANTARA and M. TUFÍÑO-VELAZQUEZ 16722 Mechanically activated Pt–Ni and Pt–Co alloys as electrocatalysts in the oxygen reduction reaction
- B. RUIZ-CAMACHO, J.H. MARTÍNEZ-GONZÁLEZ, R.G. GONZÁLEZ-HUERTA and M. TUFÍÑO-VELÁZQUEZ 16731 Kinetic study of oxygen reduction reaction and PEM fuel cell performance of Pt/TiO₂-C electrocatalyst
- W.J. PECH-RODRÍGUEZ, D. GONZÁLEZ-QUIJANO, G. VARGAS-GUTIÉRREZ and F.J. RODRÍGUEZ-VARELA 16740 Electrophoretic deposition of polypyrrole/Vulcan XC-72 corrosion protection coatings on SS-304 bipolar plates by asymmetric alternating current for PEM fuel cells
- V.M. SANCHEZ, R. BARBOSA, L.G. ARRIAGA and J.M. RAMIREZ 16750 Real time control of air feed system in a PEM fuel cell by means of an adaptive neural-network
- M.P. GURROLA, J. GUTIÉRREZ, S. RIVAS, M. GUERRA-BALCÁZAR, J. LEDESMA-GARCÍA and L.G. ARRIAGA 16763 Evaluation of the corrosion of Sb-doped SnO₂ supports for electrolysis systems