

Volume 38

Issue 3

6 February 2013

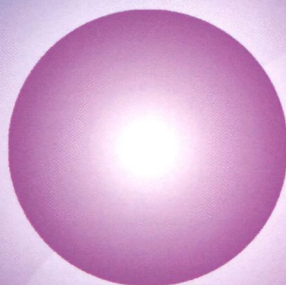
ISSN 0360-3199

International Journal of **HYDROGEN ENERGY**

Editor-in-Chief: **Emre A. Veziroğlu**

Associate Editors: **A. Basile, M.B. Gorenssek,
E.C. Kumbur, M.M. Mench,
N.Z. Muradov and J.W. Sheffield**

Assistant Editors: **J. Gong, M.D. Mat and D.P. Mishra**



includes SPECIAL SECTION

**2011 Zing International Hydrogen
and Fuel Cells Conference: from
Nanomaterials to Demonstrators**

Guest Editors: Bruno G. Pollet and Jack Brouwer

Available online at www.sciencedirect.com

SciVerse ScienceDirect



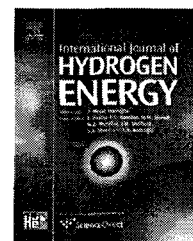


ELSEVIER

Available online at www.sciencedirect.com

SciVerse ScienceDirect

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



www.elsevier.com/locate/ijhydene

Contents

Regular Articles

Hydrogen Economy

- N. BALTA-OZKAN and E. BALDWIN 1209 Spatial development of hydrogen economy in a low-carbon UK energy system

Electrolysis/Electrolyzers

- J. KIM, H.-I. JI, H.P. DASARI, D. SHIN, H. SONG, J.-H. LEE, B.-K. KIM, H.-J. JE, H.-W. LEE and K.J. YOON 1225 Degradation mechanism of electrolyte and air electrode in solid oxide electrolysis cells operating at high polarization

Chemical/Thermochemical Hydrogen

- H. WANG, Y. CHANG, S. DONG, Z. LEI, Q. ZHU, P. LUO and Z. XIE 1236 Investigation on hydrogen production using multicomponent aluminum alloys at mild conditions and its mechanism
- S. MANDAL and A.K. JANA 1244 Prediction of phase equilibria of H₂ system using artificial neural network: Experimental verification

Solar Hydrogen

- M. NIU, D. CHENG and D. CAO 1251 Enhanced photoelectrochemical performance of anatase TiO₂ by metal-assisted S–O coupling for water splitting
- S.-W. CAO, Y.-P. YUAN, J. FANG, M.M. SHAHJAMALI, F.Y.C. BOEY, J. BARBER, S.C. JOACHIM LOO and C. XUE 1258 In-situ growth of CdS quantum dots on g-C₃N₄ nanosheets for highly efficient photocatalytic hydrogen generation under visible light irradiation
- N. BISWAL and K.M. PARIDA 1267 Enhanced hydrogen production over CdSe QD/ZTP composite under visible light irradiation without using co-catalyst
- Y. YU, G. CHEN, G. WANG and Z. LV 1278 Visible-light-driven ZnIn₂S₄/CdIn₂S₄ composite photocatalyst with enhanced performance for photocatalytic H₂ evolution
- G. ZHANG, W. ZHANG, P. WANG, D. MINAKATA, Y. CHEN and J. CRITTENDEN 1286 Stability of an H₂-producing photocatalyst (Ru/(CuAg)_{0.15}In_{0.3}Zn_{1.4}S₂) in aqueous solution under visible light irradiation

Bio Hydrogen

- J.F. CASTRO, V. RAZMILIC and Z.P. GERDTZEN 1297 Genome based metabolic flux analysis of *Ethanoligenens harbinense* for enhanced hydrogen production
- B. VALLE, A. REMIRO, A.T. AGUAYO, J. BILBAO and A.G. GAYUBO 1307 Catalysts of Ni/α-Al₂O₃ and Ni/La₂O₃-αAl₂O₃ for hydrogen production by steam reforming of bio-oil aqueous fraction with pyrolytic lignin retention
- C. VARRONE, S. ROSA, F. FIOCCHETTI, B. GIUSSANI, G. IZZO, G. MASSINI, A. MARONE, A. SIGNORINI and A. WANG 1319 Enrichment of activated sludge for enhanced hydrogen production from crude glycerol
- H. LIU, H. HU, G. LUO, A. LI, M. XU and H. YAO 1332 Enhancement of hydrogen production in steam gasification of sewage sludge by reusing the calcium in lime-conditioned sludge
- X. GUO, J. LIU and B. XIAO 1342 Bioelectrochemical enhancement of hydrogen and methane production from the anaerobic digestion of sewage sludge in single-chamber membrane-free microbial electrolysis cells

Methanol/Ethanol Hydrogen

- C. POJANAVARAPHAN,
A. LUENGNARUEMITCHAI and E. GULARI 1348 Effect of catalyst preparation on Au/Ce_{1-x}Zr_xO₂ and Au-Cu/Ce_{1-x}Zr_xO₂ for steam reforming of methanol
- N. KATIYAR, S. KUMAR and S. KUMAR 1363 Comparative thermodynamic analysis of adsorption, membrane and adsorption-membrane hybrid reactor systems for methanol steam reforming
- S.J. HAN, Y. BANG, J.G. SEO, J. YOO and I.K. SONG 1376 Hydrogen production by steam reforming of ethanol over mesoporous Ni-Al₂O₃-ZrO₂ xerogel catalysts: Effect of Zr/Al molar ratio

Catalysts/Electrocatalysis

- Y. XU, Q. WEI, H. LONG, X. ZHANG,
S. SHANG, X. DAI and Y. YIN 1384 CO₂ reforming of CH₄ by synergies of binode thermal plasma and catalysts
- H. ZHAO and T.S. ZHAO 1391 Highly active carbon nanotube-supported Pd electrocatalyst for oxidation of formic acid prepared by etching copper template method
- T. UMEGAKI, C. TAKEI, Q. XU and Y. KOJIMA 1397 Fabrication of hollow metal oxide-nickel composite spheres and their catalytic activity for hydrolytic dehydrogenation of ammonia borane
- S. SONG, K. WANG, Y. LIU, C. HE, Y. LIANG,
R. FU, D. WU and Y. WANG 1405 Highly ordered mesoporous carbons as the support for Pt catalysts towards alcohol electrooxidation: The combined effect of pore size and electrical conductivity
- J. BAI, Q. ZHU, Z. LV, H. DONG, J. YU and L. DONG 1413 Nitrogen-doped graphene as catalysts and catalyst supports for oxygen reduction in both acidic and alkaline solutions

Steam Reforming

- A. OBRADOVIĆ, B. LIKOZAR and J. LEVEC 1419 Catalytic surface development of novel nickel plate catalyst with combined thermally annealed platinum and alumina coatings for steam methane reforming
- F. BORGOGNONI, S. TOSTI, M. VADRUCCI and A. SANTUCCI 1430 Combined methane and ethanol reforming for pure hydrogen production through Pd-based membranes

Storage

- U. ULMER, J. HU, M. FRANZREB and M. FICHTNER 1439 Preparation, scale-up and testing of nanoscale, doped amide systems for hydrogen storage
- J. XIAO, R. PENG, D. COSSEMENT,
P. BÉNARD and R. CHAHINE 1450 CFD model for charge and discharge cycle of adsorptive hydrogen storage on activated carbon
- Y. PANG, Y. LIU, X. ZHANG, M. GAO and H. PAN 1460 Role of particle size, grain size, microstrain and lattice distortion in improved dehydrogenation properties of the ball-milled Mg(AlH₄)₂
- D.E. DEMIROCAK, S.S. SRINIVASAN,
M.K. RAM, D.Y. GOSWAMI and E.K. STEFANAKOS 1469 Volumetric hydrogen sorption measurements – Uncertainty error analysis and the importance of thermal equilibration time
- M. ISMAIL, Y. ZHAO and S.X. DOU 1478 An investigation on the hydrogen storage properties and reaction mechanism of the destabilized MgH₂-Na₃AlH₆ (4:1) system
- Y. BOUHADDA, M. BOUOUDINA,
N. FENINECHE and Y. BOUDOUMA 1484 Elastic properties of perovskite-type hydride NaMgH₃ for hydrogen storage
- R.A. JAT, S.C. PARIDA, R. AGARWAL and S.G. KULKARNI 1490 Effect of Ni content on the hydrogen storage behavior of ZrCo_{1-x}Ni_x alloys

Nano Powders

- M. ANIK and N. KÜÇÜKDEVECİ 1501 Discharging characteristics of CoB nano powders

Tritium

- M. CHEN, G.-D. LU, J. REN, H.-Z. ZHU,
G.-K. ZHANG and J.-W. BA 1510 3.5-Year tritium aging effect on isotopic exchange at constant flow rate between gaseous hydrogen and palladium deuteride

PE Fuel Cells

- J.-D. KIM, A. DONNADIO, M.-S. JUN and M.L. DI VONA 1517 Crosslinked SPES-SPPSU membranes for high temperature PEMFCs
- L.-C. JHENG, C.-Y. HUANG and S.L.-C. HSU 1524 Sulfonated MWNT and imidazole functionalized MWNT/polybenzimidazole composite membranes for high-temperature proton exchange membrane fuel cells
- P. YI, L. PENG, T. ZHOU, H. WU and X. LAI 1535 Cr–N–C multilayer film on 316L stainless steel as bipolar plates for proton exchange membrane fuel cells using closed field unbalanced magnetron sputter ion plating
- S.I. KIM, K.D. BAIK, B.J. KIM, N.W. LEE and M.S. KIM 1544 Experimental study on mitigating the cathode flooding at low temperature by adding hydrogen to the cathode reactant gas in PEM fuel cell

SQ Fuel Cells

- Y. ZHAO, Z. XU, C. XIA and Y. LI 1553 Oxide ion and proton conduction in doped ceria–carbonate composite materials
- D.W. YUN, H.S. SEO, J.H. JUN and K.Y. KIM 1560 Evaluation of Nb- or Mo-alloyed ferritic stainless steel as SOFC interconnect by using button cells
- G. KIM, N. LEE, K.-B. KIM, B.-K. KIM, H. CHANG, S.-J. SONG and J.-Y. PARK 1571 Various synthesis methods of aliovalent-doped ceria and their electrical properties for intermediate temperature solid oxide electrolytes

Fuel Cells - General

- U. KARRA, S.S. MANICKAM, J.R. MCCUTCHEON, N. PATEL and B. LI 1588 Power generation and organics removal from wastewater using activated carbon nanofiber (ACNF) microbial fuel cells (MFCs)
- L. LI and J.C. NINO 1598 Proton-conducting barium stannates: Doping strategies and transport properties

I.C. Engines

- S. FRIGO and R. GENTILI 1607 Analysis of the behaviour of a 4-stroke Si engine fuelled with ammonia and hydrogen
- A. MARIANI, M.V. PRATI, A. UNICH and B. MORRONE 1616 Combustion analysis of a spark ignition i. c. engine fuelled alternatively with natural gas and hydrogen-natural gas blends
- E. SUKJIT, J.M. HERREROS, K.D. DEARN, A. TSOLAKIS and K. THEINNOI 1624 Effect of hydrogen on butanol–biodiesel blends in compression ignition engines

Combustion

- J. FU, C. TANG, W. JIN, L.D. THI, Z. HUANG and Y. ZHANG 1636 Study on laminar flame speed and flame structure of syngas with varied compositions using OH-PLIF and spectrograph

Embrittlement/Properties

- N.K. DAS and T. SHOJI 1644 An atomic study of hydrogen effect on the early stage oxidation of transition metal surfaces
- N. YASUDA, T. TSUCHIYA, N. OKINAKA and T. AKIYAMA 1657 Thermal conductivity and cycle characteristic of metal hydride sheet formed using aramid pulp and carbon fiber

Erratum

- H.J. PASMAN and W.J. ROGERS 1662 Erratum to “Risk assessment by means of Bayesian networks: A comparative study of compressed and liquefied H₂ transportation and tank station risks” [Int J Hydrogen Energy 37 (2012) 17415–17425]

Special Section Papers

- B.G. POLLET 1663 Editorial
- M. KHZOUEZ, J. WOOD, B. POLLET and W. BUJALSKI 1664 Characterization and activity test of commercial Ni/Al₂O₃, Cu/ZnO/Al₂O₃ and prepared Ni–Cu/Al₂O₃ catalysts for hydrogen production from methane and methanol fuels

- S.J. ANDREASEN, S.K. KÆR and S. SAHLIN 1676 Control and experimental characterization of a methanol reformer for a 350 W high temperature polymer electrolyte membrane fuel cell system
- C. POHLMANN, L. RÖNTZSCH, T. WEIßGÄRBER and B. KIEBACK 1685 Heat and gas transport properties in pelletized hydride-graphite-composites for hydrogen storage applications
- C. BENNETT, C. EASTWICK and G. WALKER 1692 Effect of a varying effective thermal conductivity term on heat conduction through a physical model of a hydride bed
- S. CRUZ-MANZO, R. CHEN and P. RAMA 1702 Study of current distribution and oxygen diffusion in the fuel cell cathode catalyst layer through electrochemical impedance spectroscopy
- J.-C. LIN, F.-P. TING, T.-Y. LEE, S.-D. CHYOU and C.-M. LAI 1714 $\text{La}_{0.8}\text{Sr}_{0.2}\text{Mn}_{1-x}\text{Ru}_x\text{O}_{3-\delta}$ as a cathode material for solid oxide fuel cells
- K. KENDALL and A. MEADOWCROFT 1725 Improved ceramics leading to microtubular Solid Oxide Fuel Cells (mSOFCs)
- K.S. HOWE, E.R. CLARK, J. BOWEN and K. KENDALL 1731 A novel water-based cathode ink formulation
- E. KIM, J. PARK, J.H. CHO and I. MOON 1737 Simulation of hydrogen leak and explosion for the safety design of hydrogen fueling station in Korea