

174
980/p5S

Volume 266, 15 November 2014

ISSN 0378-7753



JOURNAL OF POWER SOURCES

The International Journal on the Science and
Technology of Electrochemical Energy Systems

Regional Editors

C.K. Dyer (N&S America)
Z. Ogumi (Japan & P.R. China)
S. Passerini (Europe, Middle East
and Africa)
D.A.J. Rand (Asia-Pacific)

**Regional and Special
Issues Co-ordinating
Editor**

P.T. Moseley

**Founding
Editor**
D.H. Collins

Available online at www.sciencedirect.com

ScienceDirect



Contents

Fuel Cells: Science and Technology

Activated nitrogen-doped carbon nanofibers with hierarchical pore as efficient oxygen reduction reaction catalyst for microbial fuel cells	36
X. Yang, W. Zou, Y. Su, Y. Zhu, H. Jiang, J. Shen, C. Li	
Carbon corrosion of proton exchange membrane fuel cell catalyst layers studied by scanning transmission X-ray microscopy	66
A.P. Hitchcock, V. Berejnov, V. Lee, M. West, V. Colbow, M. Dutta, S. Wessel	
Application of sol-gel technique to synthesis of copper-cobalt spinel on the ferritic stainless steel used for solid oxide fuel cell interconnects	79
P. Paknahad, M. Askari, M. Ghorbanzadeh	
Simultaneous formation of nitrogen and sulfur-doped transition metal catalysts for oxygen reduction reaction through pyrolyzing carbon-supported copper phthalocyanine tetrasulfonic acid tetrasodium salt	88
X. Qing, J. Shi, C. Ma, M. Fan, Z. Bai, Z. Chen, J. Qiao, J. Zhang	
Membrane electrode assembly with enhanced platinum utilization for high temperature proton exchange membrane fuel cell prepared by catalyst coating membrane method	107
H. Liang, H. Su, B.G. Pollet, V. Linkov, S. Pasupathi	
Alkaline stable C2-substituted imidazolium-based cross-linked anion exchange membranes for alkaline fuel cell applications	186
B. Lin, F. Chu, Y. Ren, B. Jia, N. Yuan, H. Shang, T. Feng, Y. Zhu, J. Ding	
Influence of cationic structures on oxygen reduction reaction at Pt electrode in fluorohydrogenate ionic liquids	193
P. Kiatkittikul, J. Yamaguchi, R. Taniki, K. Matsumoto, T. Nohira, R. Hagiwara	
A high activity nitrogen-doped carbon catalyst for oxygen reduction reaction derived from polyaniline-iron coordination polymer...	222
G. Wang, K. Jiang, M. Xu, C. Min, B. Ma, X. Yang	
Interfacial electron transfer of <i>Shewanella putrefaciens</i> enhanced by nanoflaky nickel oxide array in microbial fuel cells	226
Y. Qiao, X.-S. Wu, C.M. Li	
Evaluation of performances of solid oxide fuel cells with symmetrical electrode material	241
P. Zhang, G. Guan, D.S. Khaerudini, X. Hao, C. Xue, M. Han, Y. Kasai, A. Abudula	
Facile synthesis of platinum-ruthenium nanodendrites supported on reduced graphene oxide with enhanced electrocatalytic properties	259
J.-N. Zheng, S.-S. Li, F.-Y. Chen, N. Bao, A.-J. Wang, J.-R. Chen, J.-J. Feng	
Cathode supported tubular solid oxide fuel cells with nanostructured $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_3$ electrocatalysts	268
L. Wu, L. Zhao, Z. Zhan, C. Xia	
Enhanced triple-phase boundary density in infiltrated electrodes for solid oxide fuel cells demonstrated by high-resolution tomography	291
M. Kishimoto, M. Lomberg, E. Ruiz-Trejo, N.P. Brandon	
Platinum-cobalt catalysts for the oxygen reduction reaction in high temperature proton exchange membrane fuel cells – Long term behavior under ex-situ and in-situ conditions	313
A. Schenck, C. Grimmer, M. Perchthaler, S. Weinberger, B. Pichler, C. Heinzl, C. Scheu, F.-A. Mautner, B. Bitschnau, V. Hacker	
Effects of anode flooding on the performance degradation of polymer electrolyte membrane fuel cells	332
M. Kim, N. Jung, K.S. Eom, S.J. Yoo, J.Y. Kim, J.H. Jang, H.-J. Kim, B.K. Hong, E.A. Cho	
Synthesis and characterization of 3D Ni nanoparticle/carbon nanotube cathodes for hydrogen evolution in alkaline electrolyte	365
M.A. McArthur, L. Jorge, S. Coulombe, S. Omanovic	
Densification of $\text{Ce}_{0.9}\text{Gd}_{0.1}\text{O}_{1.95}$ barrier layer by <i>in-situ</i> solid state reaction	393
D.W. Ni, V. Esposito	

Effect of carbon material on Pd catalyst for formic acid electrooxidation reaction	481
J. Chang, S. Li, L. Feng, X. Qin, G. Shao	
Fuel Cells: Engineering	
Optimum design of a fuel-cell powertrain based on multiple design criteria.....	7
I.L. Sarioglu, B. Czapnik, E. Bostanci, O.P. Klein, H. Schröder, F. Küçükay	
A new model for thermal contact resistance between fuel cell gas diffusion layers and bipolar plates	51
H. Sadeghifar, N. Djilali, M. Bahrami	
Slip-cast and hot-solution infiltrated porous yttria stabilized zirconia (YSZ) supported tubular fuel cells	121
A.R. Hanifi, S. Paulson, A. Torabi, A. Shinbine, M.C. Tucker, V. Birss, T.H. Etzell, P. Sarkar	
Effects of polytetrafluoroethylene treatment and compression on gas diffusion layer microstructure using high-resolution X-ray computed tomography.....	213
N. Khajeh-Hosseini-Dalasm, T. Sasabe, T. Tokumasu, U. Pasaogullari	
Fuel Cells: Fuel Processing	
Visible light driven (Fe, Cr)-codoped $\text{La}_2\text{Ti}_2\text{O}_7$ photocatalyst for efficient photocatalytic hydrogen production.....	304
S. Hu, L. Jia, B. Chi, J. Pu, L. Jian	
Lithium Batteries: Science and Technology	
Mica-like vanadium pentoxide-nanostructured thin film as high-performance cathode for lithium-ion batteries.....	1
D. Yu, Y. Qiao, X. Zhou, J. Wang, C. Li, C. Chen, Q. Huo	
A novel hierarchically structured and highly hydrophilic poly(vinyl alcohol-co-ethylene)/poly(ethylene terephthalate) nanoporous membrane for lithium-ion battery separator.....	29
M. Xia, Q. Liu, Z. Zhou, Y. Tao, M.F. Li, K. Liu, Z. Wu, D. Wang	
Magnetron sputtering amorphous carbon coatings on metallic lithium: Towards promising anodes for lithium secondary batteries ..	43
Y.J. Zhang, X.Y. Liu, W.Q. Bai, H. Tang, S.J. Shi, X.L. Wang, C.D. Gu, J.P. Tu	
Enhancing the high-rate performance of $\text{Li}_4\text{Ti}_5\text{O}_{12}$ anode material for lithium-ion battery by a wet ball milling assisted solid-state reaction and ultra-high speed nano-pulverization.....	60
Z. Huang, D. Wang, Y. Lin, X. Wu, P. Yan, C. Zhang, D. He	
Stirring effect in hydrothermal synthesis of nano C-LiFePO ₄	99
K. Vediappan, A. Guerfi, V. Gariépy, G.P. Demopoulos, P. Hovington, J. Trottier, A. Mauger, C.M. Julien, K. Zaghib	
Solid-state synthesis of submicron-sized $\text{Li}_4\text{Ti}_5\text{O}_{12}/\text{Li}_2\text{TiO}_3$ composites with rich grain boundaries for lithium ion batteries	114
Y. Wang, A. Zhou, X. Dai, L. Feng, J. Li, J. Li	
Nitrogen-doped $\text{Li}_4\text{Ti}_5\text{O}_{12}$ nanosheets with enhanced lithium storage properties.....	150
B. Wang, J. Wang, J. Cao, H. Ge, Y. Tang	
Reliable benchmark material for anatase TiO_2 in Li-ion batteries: On the role of dehydration of commercial TiO_2	155
E. Madej, F. La Mantia, B. Mei, S. Klink, M. Muhler, W. Schuhmann, E. Ventosa	
Development of a scalable spray pyrolysis process for the production of non-hollow battery materials.....	175
M. Lengyel, D. Elhassid, G. Atlas, W.T. Moller, R.L. Axelbaum	
Fabrication and electrochemical characterization of amorphous lithium iron silicate thin films as positive electrodes for lithium batteries	179
I. Quinzeni, S. Ferrari, E. Quartarone, D. Capsoni, M. Caputo, A. Goldoni, P. Mustarelli, M. Bini	
Lithium dendrite and solid electrolyte interphase investigation using OsO_4	198
M. Zier, F. Scheiba, S. Oswald, J. Thomas, D. Goers, T. Scherer, M. Klose, H. Ehrenberg, J. Eckert	
Carbonaceous anodes for lithium-ion batteries in combination with protic ionic liquids-based electrolytes.....	208
S. Menne, M. Schroeder, T. Vogl, A. Balducci	
Effects of organic silicon compounds as additives on charge-discharge cycling efficiencies of lithium in nonaqueous electrolytes for rechargeable lithium cells	232
R. Yanagisawa, H. Endo, M. Uhno, H. Morimoto, S.-i. Tobishima	
Nitridation Br-doped $\text{Li}_4\text{Ti}_5\text{O}_{12}$ anode for high rate lithium ion batteries.....	323
J. Wang, Z. Yang, W. Li, X. Zhong, L. Gu, Y. Yu	
Formation of Li_2MnO_3 investigated by <i>in situ</i> synchrotron probes.....	341
Y. Kan, Y. Hu, J. Croy, Y. Ren, C.-J. Sun, S.M. Heald, J. Bareño, I. Bloom, Z. Chen	
The use of well-aligned composite nanorod arrays as anode material for lithium rechargeable batteries.....	353
B.D. Polat, O. Keles	
Preparation and performance of polymer electrolyte based on poly(vinylidene fluoride)/polysulfone blend membrane via thermally induced phase separation process for lithium ion battery	401
Q. Cheng, Z. Cui, J. Li, S. Qin, F. Yan, J. Li	
Nano-scale simultaneous observation of Li-concentration profile and Ti-, O electronic structure changes in an all-solid-state Li-ion battery by spatially-resolved electron energy-loss spectroscopy	414
K. Yamamoto, R. Yoshida, T. Sato, H. Matsumoto, H. Kurobe, T. Hamanaka, T. Kato, Y. Iriyama, T. Hirayama	
Ultrathin ZnO coating for improved electrochemical performance of $\text{LiNi}_{0.5}\text{Co}_{0.2}\text{Mn}_{0.3}\text{O}_2$ cathode material.....	433
J.-Z. Kong, C. Ren, G.-A. Tai, X. Zhang, A.-D. Li, D. Wu, H. Li, F. Zhou	
High-rate charge/discharge properties of Li-ion battery using carbon-coated composites of graphites, vapor grown carbon fibers, and carbon nanohorns	471
R. Yuge, N. Tamura, T. Manako, K. Nakano, K. Nakahara	

Lithium Batteries: Engineering

Graphite LiFePO ₄ lithium-ion battery working at the heat engine coolant temperature.....	132
A. Lewandowski, B. Kurc, A. Swiderska-Moczek, N. Kusa	
An investigation on the significance of reversible heat to the thermal behavior of lithium ion battery through simulations	422
R. Zhao, J. Gu, J. Liu	
State-of-health monitoring of 18650 4S packs with a single-point impedance diagnostic.....	512
C.T. Love, M.B.V. Virji, R.E. Rocheleau, K.E. Swider-Lyons	

Lithium Batteries: Applications

Characterization tests for plug-in hybrid electric vehicle application of graphite/LiNi _{0.4} Mn _{1.6} O ₄ cells with two different separators and electrolytes.....	170
C. Arizzani, F. De Giorgio, M. Mastragostino	

Lead-Acid Batteries: Science and Technology

Investigating the use of porous, hollow glass microspheres in positive lead acid battery plates.....	496
M. Sorge, T. Bean, T. Woodland, J. Canning, I.F. Cheng, D.B. Edwards	

Other Electrochemical Power Sources: Science and Technology

The application of Co-Al-hydrotalcite as a novel additive of positive material for nickel–metal hydride secondary cells.....	22
Z. Feng, Z. Yang, B. Yang, Z. Zhang, X. Xie	
Investigation on the performance evaluation method of flow batteries.....	145
Q. Zheng, F. Xing, X. Li, T. Liu, Q. Lai, G. Ning, H. Zhang	
Identification of a new pseudo-binary hydroxide during calendar corrosion of (La, Mg) ₂ Ni ₇ -type hydrogen storage alloys for Nickel–Metal Hydride batteries	162
J. Monnier, H. Chen, S. Joiret, J. Bourgon, M. Latroche	
Synthesis and characterization of a new layered cathode material for sodium ion batteries.....	275
S. Doubaji, M. Valvo, I. Saadoune, M. Dahbi, K. Edström	
Development of flexible secondary alkaline battery with carbon nanotube enhanced electrodes.....	296
Z. Wang, S. Mitra	

Supercapacitors: Science and Technology

Considerations about the influence of the structural and electrochemical properties of carbonaceous materials on the behavior of lithium-ion capacitors	250
M. Schroeder, S. Menne, J. Ségalini, D. Saurel; M. Casas-Cabanas, S. Passerini, M. Winter, A. Balducci	
Redox reaction between graphene oxide and In powder to prepare In ₂ O ₃ /reduced graphene oxide hybrids for supercapacitors.....	282
X. Xu, T. Wu, F. Xia, Y. Li, C. Zhang, L. Zhang, M. Chen, X. Li, L. Zhang, Y. Liu, J. Gao	
One-step triple-phase interfacial synthesis of polyaniline-coated polypyrrole composite and its application as electrode materials for supercapacitors	347
W. Lei, P. He, S. Zhang, F. Dong, Y. Ma	
Polyvinylpyrrolidone as binder for castable supercapacitor electrodes with high electrochemical performance in organic electrolytes	374
M. Aslan, D. Weingarth, N. Jäckel, J.S. Atchison, I. Grobelsek, V. Presser	
Ternary manganese ferrite/graphene/polyaniline nanostructure with enhanced electrochemical capacitance performance	384
P. Xiong, C. Hu, Y. Fan, W. Zhang, J. Zhu, X. Wang	
Redox supercapacitor performance of nanocrystalline molybdenum nitrides obtained by ammonolysis of chloride- and amide-derived precursors	456
S.I.U. Shah, A.L. Hector, J.R. Owen	
Carbon additives for electrical double layer capacitor electrodes.....	475
D. Weingarth, D. Cericola, F.C.F. Mornaghini, T. Hucke, R. Kötz	
Flexible all-solid-state supercapacitors based on graphene/carbon black nanoparticle film electrodes and cross-linked poly(vinyl alcohol)-H ₂ SO ₄ porous gel electrolytes	488
H. Fei, C. Yang, H. Bao, G. Wang	

Photo-electrochemical Cells

The trade-off of light trapping between top and bottom cell in micromorph tandem solar cells with sputtering ZnO: Al glass substrate	138
L. Bai, B. Liu, J. Fan, D. Zhang, C. Wei, J. Sun, Y. Zhao, X. Zhang	
High-efficiency dye-sensitized solar cells based on ultra-long single crystalline titanium dioxide nanowires.....	440
L. Que, Z. Lan, W. Wu, J. Wu, J. Lin, M. Huang	
In situ electropolymerization of polyaniline/cobalt sulfide decorated carbon nanotube composite catalyst toward triiodide reduction in dye-sensitized solar cells	448
Y. Xiao, W.-Y. Wang, S.-W. Chou, T.-W. Lin, J.-Y. Lin	
Metal sulfide counter electrodes for dye-sensitized solar cells: A balanced strategy for optical transparency and electrochemical activity	464
J. Song, G.R. Li, C.Y. Wu, X.P. Gao	