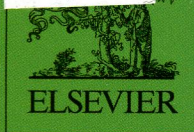


TUM  
J80/p53

Volume 256, 15 June 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](http://www.sciencedirect.com)

**ScienceDirect**



## Contents

### Reviews

- Review and recent advances in battery health monitoring and prognostics technologies for electric vehicle (EV) safety and mobility ..... 110  
 S.M. Rezvanizani, Z. Liu, Y. Chen, J. Lee
- A survey of mathematics-based equivalent-circuit and electrochemical battery models for hybrid and electric vehicle simulation ..... 410  
 A. Seaman, T.-S. Dao, J. McPhee

### Fuel Cells: Science and Technology

- Performance of a passive direct ethanol fuel cell ..... 14  
 J.P. Pereira, D.S. Falcão, V.B. Oliveira, A.M.F.R. Pinto
- A polarization model for a solid oxide fuel cell with a mixed ionic and electronic conductor as electrolyte ..... 43  
 S. Shen, Y. Yang, L. Guo, H. Liu
- Multi-layer thin-film electrolytes for metal supported solid oxide fuel cells ..... 52  
 M. Haydn, K. Ortner, T. Franco, S. Uhlenbruck, N.H. Menzler, D. Stöver, G. Bräuer, A. Venskutonis, L.S. Sigl, H.-P. Buchkremer, R. Vaßen
- Controllable synthesis of vertically aligned polypyrrole nanowires as advanced electrode support for fuel cells ..... 125  
 Z. Xia, S. Wang, L. Jiang, H. Sun, G. Sun
- Electrocatalytic performance enhancement of  $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}-\text{Y}_2\text{O}_3$  stabilized  $\text{ZrO}_2$  cathodes prepared by an impregnation technique ..... 312  
 J. Chen, Y. Liu, B. Chi, J. Pu, J. Li
- The effect of high anionomer loading with silver nanowire catalysts on the oxygen reduction reaction in alkaline environment ..... 319  
 A.J. Lemke, A.W. O'Toole, R.S. Phillips, E.T. Eisenbraun
- Three dimensional graphene foam supported platinum–ruthenium bimetallic nanocatalysts for direct methanol and direct ethanol fuel cell applications ..... 329  
 C.-C. Kung, P.-Y. Lin, Y. Xue, R. Akolkar, L. Dai, X. Yu, C.-C. Liu
- In situ electrodeposition of graphene/nano-palladium on carbon cloth for electrooxidation of methanol in alkaline media ..... 354  
 A. Safavi, H. Kazemi, S.H. Kazemi
- Quantitative microstructure characterization of a Ni–YSZ bi-layer coupled with simulated electrode polarisation ..... 394  
 F. Usseglio-Viretta, J. Laurencin, G. Delette, J. Villanova, P. Cloetens, D. Leguillon
- A rapid preparation of acicular Ni impregnated anode with enhanced conductivity and operational stability ..... 424  
 X. Zhu, C. Guan, Z. Lü, B. Wei, Y. Li, W. Su

### Fuel Cells: Engineering

- A method of determining interface methanol concentration in an operating direct methanol fuel cell ..... 183  
 J. Han, H. Liu
- Direct measurement of through-plane thermal conductivity of partially saturated fuel cell diffusion media ..... 212  
 G. Xu, J.M. LaManna, J.T. Clement, M.M. Mench
- Performance comparison between high temperature and traditional proton exchange membrane fuel cell stacks using electrochemical impedance spectroscopy ..... 250  
 Y. Zhu, W.H. Zhu, B.J. Tatarchuk
- Bulk and contact resistances of gas diffusion layers in proton exchange membrane fuel cells ..... 449  
 D. Ye, E. Gauthier, J.B. Benziger, M. Pan

ScienceDirect

Full text of this journal is available, on-line from ScienceDirect. Visit [www.sciencedirect.com](http://www.sciencedirect.com) for more information.

Temperature dynamics and control of a water-cooled fuel cell stack .....	470
D. O'Keefe, M.Y. El-Sharkh, J.C. Telotte, S. Palanki	
<b>Fuel Cells: Fuel Processing</b>	
Modeling of methanol decomposition on Pt/CeO <sub>2</sub> /ZrO <sub>2</sub> catalyst in a packed bed microreactor .....	80
A. Pohar, D. Belavič, G. Dolanc, S. Hočvar	
Active sites over CuO/CeO <sub>2</sub> and inverse CeO <sub>2</sub> /CuO catalysts for preferential CO oxidation .....	301
S. Zeng, Y. Wang, S. Ding, J.J.H.B. Sattler, E. Borodina, L. Zhang, B.M. Weckhuysen, H. Su	
Insight into the structural construction of a perfluorosulfonic acid membrane derived from a polymeric dispersion .....	383
Z. Wang, H. Tang, J. Li, Y. Zeng, L. Chen, M. Pan	
<b>Lithium Batteries: Science and Technology</b>	
Improved cycle stability and high-rate capability of Li <sub>3</sub> VO <sub>4</sub> -coated Li[Ni <sub>0.5</sub> Co <sub>0.2</sub> Mn <sub>0.3</sub> ]O <sub>2</sub> cathode material under different voltages .....	1
Y. Huang, F.-M. Jin, F.-J. Chen, L. Chen	
An approach to application for LiNi <sub>0.6</sub> Co <sub>0.2</sub> Mn <sub>0.2</sub> O <sub>2</sub> cathode material at high cutoff voltage by TiO <sub>2</sub> coating .....	20
Y. Chen, Y. Zhang, B. Chen, Z. Wang, C. Lu	
Study of sulfonated polyether ether ketone with pendant lithiated fluorinated sulfonic groups as ion conductive binder in lithium-ion batteries .....	28
Z. Wei, L. Xue, F. Nie, J. Sheng, Q. Shi, X. Zhao	
From Si wafers to cheap and efficient Si electrodes for Li-ion batteries .....	32
M. Gauthier, D. Reyter, D. Mazouzi, P. Moreau, D. Guyomard, B. Lestriez, L. Roué	
Delithiation kinetics study of carbon coated and carbon free LiFePO <sub>4</sub> .....	61
D. Lepage, F. Sobh, C. Kuss, G. Liang, S.B. Schougaard	
One-step hydrothermal method synthesis of core-shell LiNi <sub>0.5</sub> Mn <sub>1.5</sub> O <sub>4</sub> spinel cathodes for Li-ion batteries .....	66
Y. Liu, M. Zhang, Y. Xia, B. Qiu, Z. Liu, X. Li	
Electrochemical characteristics of iron oxide nanowires during lithium-promoted conversion reaction .....	133
I. Hong, M. Angelucci, R. Verrelli, M.G. Betti, S. Panero, F. Croce, C. Mariani, B. Scrosati, J. Hassoun	
A simple synthesis of hollow carbon nanofiber-sulfur composite via mixed-solvent process for lithium-sulfur batteries .....	137
Q. Li, Z. Zhang, K. Zhang, J. Fang, Y. Lai, J. Li	
Ascorbic acid-assisted synthesis of cobalt ferrite (CoFe <sub>2</sub> O <sub>4</sub> ) hierarchical flower-like microspheres with enhanced lithium storage properties .....	153
Q.Q. Xiong, J.P. Tu, S.J. Shi, X.Y. Liu, X.L. Wang, C.D. Gu	
Synthesis of layered cathode material 0.5Li <sub>2</sub> MnO <sub>3</sub> -0.5LiMn <sub>1/3</sub> Ni <sub>1/3</sub> Co <sub>1/3</sub> O <sub>2</sub> by an improved co-precipitation method for lithium-ion battery .....	178
Z. Zhu, L. Zhu	
High performance amorphous-Si@SiO <sub>x</sub> /C composite anode materials for Li-ion batteries derived from ball-milling and in situ carbonization .....	190
D. Wang, M. Gao, H. Pan, J. Wang, Y. Liu	
Raman diagnostics of LiCoO <sub>2</sub> electrodes for lithium-ion batteries .....	220
T. Gross, C. Hess	
Electrochemical impedance analysis of electrodeposited Si-O-C composite thick film on Cu microcones-arrayed current collector for lithium ion battery anode .....	226
T. Hang, D. Mukoyama, H. Nara, T. Yokoshima, T. Momma, M. Li, T. Osaka	
Rapid charge and discharge property of high capacity lithium ion battery applying three-dimensionally patterned electrode .....	244
A. Izumi, M. Sanada, K. Furuichi, K. Teraki, T. Matsuda, K. Hiramatsu, H. Munakata, K. Kanamura	
<i>In situ</i> surface enhanced Raman spectroscopic studies of solid electrolyte interphase formation in lithium ion battery electrodes .....	324
S. Hy, Felix, Y.-H. Chen, J.-y. Liu, J. Rick, B.-J. Hwang	
Hierarchical carbon-coated LiFePO <sub>4</sub> nano-grain microspheres with high electrochemical performance as cathode for lithium ion batteries .....	336
Y.-F. Wu, Y.-N. Liu, S.-W. Guo, S.-N. Zhang, T.-N. Lu, Z.-M. Yu, C.-S. Li, Z.-P. Xi	
Nitrogen-doped graphene/sulfur composite as cathode material for high capacity lithium-sulfur batteries .....	361
X. Wang, Z. Zhang, Y. Qu, Y. Lai, J. Li	
Impact of the flame retardant additive triphenyl phosphate (TPP) on the performance of graphite/LiFePO <sub>4</sub> cells in high power applications .....	430
K. Ciosek Högstöm, H. Lundgren, S. Wilken, T.G. Zavalis, M. Behm, K. Edström, P. Jacobsson, P. Johansson, G. Lindbergh	
Effect of cation and anion doping on microstructure and electrochemical properties of the LiMn <sub>1.5</sub> Ni <sub>0.5</sub> O <sub>4-δ</sub> spinel .....	457
N.M. Hagh, G.G. Amatucci	
Thermal properties of fully delithiated olivines .....	479
J.-S. Park, S.-M. Oh, Y.-K. Sun, S.-T. Myung	
<b>Lithium Batteries: Engineering</b>	
Performance evaluation of a non-woven lithium ion battery separator prepared through a paper-making process .....	96
X. Huang	
Two-dimensional electrochemical-thermal coupled modeling of cylindrical LiFePO <sub>4</sub> batteries .....	233
M. Xu, Z. Zhang, X. Wang, L. Jia, L. Yang	
Cathode refunctionalization as a lithium ion battery recycling alternative .....	274
M.J. Ganter, B.J. Landi, C.W. Babbitt, A. Ancil, G. Gaustad	

## Lithium Batteries: Applications

- Evaluation of lithium ion cells with titanate negative electrodes and iron phosphate positive electrode for start–stop applications ... 288  
 J.S. Wang, P. Liu, S. Soukiazian, H. Tataria, M. Dontigny, A. Guerfi, K. Zaghib, M.W. Verbrugge

## Lead-Acid Batteries: Science and Technology

- High-performance of PbO<sub>2</sub> nanowire electrodes for lead-acid battery ..... 72  
 A. Moncada, M.C. Mistretta, S. Randazzo, S. Piazza, C. Sunseri, R. Inguanta  
 Al/Pb lightweight grids prepared by molten salt electroless plating for application in lead-acid batteries ..... 294  
 B. Hong, L. Jiang, K. Hao, F. Liu, X. Yu, H. Xue, J. Li, Y. Liu

## Other Electrochemical Power Sources: Science and Technology

- Development of carbon nanotube and graphite filled polyphenylene sulfide based bipolar plates for all-vanadium redox flow batteries ..... 88  
 B. Caglar, P. Fischer, P. Kauranen, M. Karttunen, P. Elsner  
 Electrodeposition of preferentially oriented zinc for flow-assisted alkaline batteries ..... 145  
 D. Desai, X. Wei, D.A. Steingart, S. Banerjee  
 Exploration of ion migration mechanism and diffusion capability for Na<sub>3</sub>V<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>F<sub>3</sub> cathode utilized in rechargeable sodium-ion batteries ..... 258  
 W. Song, X. Ji, Z. Wu, Y. Yang, Z. Zhou, F. Li, Q. Chen, C.E. Banks

## Other Electrochemical Power Sources: Applications

- A price-responsive dispatching strategy for Vehicle-to-Grid: An economic evaluation applied to the case of Singapore ..... 345  
 D. Pelzer, D. Ciechanowicz, H. Aydt, A. Knoll

## Supercapacitors: Science and Technology

- Nano-engineering of three-dimensional core/shell nanotube arrays for high performance supercapacitors ..... 37  
 F. Grote, L. Wen, Y. Lei  
 Morphology controlled synthesis of monodisperse cobalt hydroxide for supercapacitor with high performance and long cycle life ..... 160  
 Y. Tang, Y. Liu, S. Yu, S. Mu, S. Xiao, Y. Zhao, F. Gao  
 Synthesis of porous Co<sub>3</sub>O<sub>4</sub> nanoflake array and its temperature behavior as pseudo-capacitor electrode ..... 200  
 Y.Q. Zhang, L. Li, S.J. Shi, Q.Q. Xiong, X.Y. Zhao, X.L. Wang, C.D. Gu, J.P. Tu  
 Three-dimensional MnO<sub>2</sub> nanowire/ZnO nanorod arrays hybrid nanostructure for high-performance and flexible supercapacitor electrode ..... 206  
 S. Li, J. Wen, X. Mo, H. Long, H. Wang, J. Wang, G. Fang  
 Supercapacitors based on modified graphene electrodes with poly(ionic liquid) ..... 264  
 J.P.C. Trigueiro, R.L. Lavall, G.G. Silva  
 High performance solid-state supercapacitor with PVA–KOH–K<sub>3</sub>[Fe(CN)<sub>6</sub>] gel polymer as electrolyte and separator ..... 281  
 G. Ma, J. Li, K. Sun, H. Peng, J. Mu, Z. Lei  
 A generalized multi-dimensional mathematical model for charging and discharging processes in a supercapacitor ..... 369  
 S. Allu, B. Velamur Asokan, W.A. Shelton, B. Philip, S. Pannala  
 Tetramethylammonium difluoro(oxalato)borate dissolved in ethylene/propylene carbonates as electrolytes for electrochemical capacitors ..... 404  
 S. Tian, L. Qi, M. Yoshio, H. Wang  
 Preparation and electrochemical characteristics of porous hollow spheres of NiO nanosheets as electrodes of supercapacitors ..... 440  
 W. Yu, X. Jiang, S. Ding, B.Q. Li

## Photo-electrochemical Cells

- Complexation of polyaniline and graphene for efficient counter electrodes in dye-sensitized solar cells: Enhanced charge transfer ability ..... 8  
 B. He, Q. Tang, M. Wang, C. Ma, S. Yuan  
 Tandem structured quantum dot/rod sensitized solar cell based on solvothermal synthesized CdSe quantum dots and rods ..... 102  
 M.R. Golobostanfard, H. Abdizadeh  
 Rapid charge-transfer in polypyrrole–single wall carbon nanotube complex counter electrodes: Improved photovoltaic performances of dye-sensitized solar cells ..... 170  
 B. He, Q. Tang, J. Luo, Q. Li, X. Chen, H. Cai

## Erratum

- Corrigendum to "A comparative analysis of well-to-wheel primary energy demand and greenhouse gas emissions for the operation of alternative and conventional vehicles in Switzerland, considering various energy carrier production pathways" [Journal of Power Sources 249 (2014) 333–348] ..... 485  
 M. Yazdanie, F. Noembrini, L. Dossetto, K. Boulouchos