

Nanomaterials for Applications in Energy and Biology 2017

Topical Conference at the 2017 AIChE Annual Meeting

Minneapolis, Minnesota, USA
29 October - 3 November 2017

ISBN: 978-1-5108-5783-4

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2017) by AIChE
All rights reserved.

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact AIChE
at the address below.

AIChE
120 Wall Street, FL 23
New York, NY 10005-4020

Phone: (800) 242-4363
Fax: (203) 775-5177

www.aiche.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

(85b) Self-Assembling Nanoparticles for Peptide Delivery with Enhanced Stability	1
<i>Handan Acar, Mathew R. Schnorenberg, James L. LaBelle, Matthew V. Tirrell</i>	
(85c) Block Copolymer Nanoparticle for Biofilm Dispersal of Gram-Positive MRSA and VRE	2
<i>Mary B. Chan-Park, Jianghua Li</i>	
(85d) Genetically-Targeted Brain-Machine Interface	3
<i>Jia Liu, Ariane Tom, Fikri Birey, Charu Ramakrishnan, Sergiu P. Pasca, Zhenan Bao, Karl Deisseroth</i>	
(85e) Colorimetric Detection of Nitrite Ions Based on the Aggregation of Gold Nanoparticles	4
<i>Aniruddha Kulkarni, Victoria Bird, Kirk J. Ziegler</i>	
(85f) Cancer Cell Hyperactivity and Membrane Dipolarity Monitoring Via Raman Mapping of Interfaced Graphene: Towards Non-Invasive Cancer Diagnostics	5
<i>Bijentimala Keisham, Arron Cole, Phong Nguyen, Ankit Mehta, Vikas Berry</i>	
(165a) Functionalization of Graphene By Using Protein Engineering	6
<i>Abhishek Tyagi, Irfan Haider Abidi, Zhengtang Luo</i>	
(165b) Developing Precision Medicine Using Quantum Biology: Combining Quantum States, Surface Chemistry, and Microbiology	7
<i>Prashant Nagpal, Colleen Courtney, Samuel Goodman, Anushree Chatterjee</i>	
(165d) Nanoscale Size-Controlled Electrospun Composite Mats of Chitosan with Tungsten Disulfide Inorganic Nanotubes (INT-WS₂)	8
<i>Apostolos Baklavaris, Ioannis Zuburtikudis, Constantinos Panayiotou</i>	
(165e) Biodegradable Multilayered Nanofilms for Cell Isolation and Recovery	16
<i>Wei Li, Ziyue Dong, Caroline Ahrens</i>	
(165f) Ag/Cu Bimetallic Nanoparticle-and Ionic-Graphene Composites with Enhanced Antibacterial Performance	17
<i>Anna Perdikaki, Angeliki Galeou, Georgios N. Karanikolos</i>	
(222a) Fabrication of Homologous TiO₂/NH₂-MIL-125(Ti) Heterojunction for Efficient Visible-Light-Induced Aerobic Oxidation of Benzyl Alcohol and Degradation of Tetracycline	31
<i>Xiyi Li, Yunhong Pi, Zhong Li, Jing Xiao</i>	
(222b) Mid-Infrared Surface Plasmon-Enhanced Molecular Desorption	43
<i>Weize Hu, Michael A. Filler</i>	
(222d) Plasmonic Purification: Visible-Light-Driven Generation of Reactive Oxygen Species for Water Disinfection	44
<i>Daniel Willis, Sara K. F. Stofela, Katrina Taylor, Kevin M. McPeak</i>	
(222e) Efficient Photoreduction of Bicarbonate to Formate Catalyzed By Gold-TiO₂ composite Nanocatalyst Under Solar Light	45
<i>Hanqing Pan, Alexzander Steiniger, Michael D. Heagy, Sanchari Chowdhury</i>	
(222f) Solution Combustion Synthesis and Photoelectrochemistry of Ga_xZn_{1-x}O_yN_{1-y}	46
<i>Ben Meekins</i>	
(222g) Mixed Oxide Based Redox Catalysts for Hydrogen and Liquid Fuel Co-Generation Via a Hybrid Solar-Redox Scheme	47
<i>Vasudev Pralhad Haribal, Feng He, Amit Mishra, Fanxing Li</i>	
(301a) Controllable Hydrothermal Conversion from Ni-Co-Mn Carbonate Nanoparticles to Spheres	48
<i>Yanqing Tang, Lu Yangcheng, Luo Guangsheng</i>	
(301b) Oxidative Chemical Vapor Deposition of Polyaniline: Influence of Process Conditions on Film Chemistry and Electrochemical Performance	49
<i>Yuriy Y. Smolin, Xiaobo Li, Kenneth Lau</i>	
(301c) High Performance Pillared V₂O₅ and MnO₂ Cathodes for Lithium Ion Batteries	50
<i>Yixuan Chen, Siu on Tung, Krista L. Hawthorne, Woo-ram J. Lee, Levi T. Thompson</i>	
(301d) 2D Transition Metal Carbides (MXenes): Synthesis and Applications in Electrochemical Energy Storage	51
<i>Mengqiang Zhao, Chang E. Ren, Babak Anasori, Yury Gogotsi</i>	
(301e) Design, Synthesis, and Characterization of Mixed Ionic/Electronic Conducting Surface Layers Adsorbed on Metal Oxide Particles	52
<i>Jeffrey J. Richards, Norman J. Wagner, Paul Butler</i>	
(301g) Conductive Membrane Coatings for Improving Current Density in Redox Flow Batteries	53
<i>Andrew Shah, Yong Lak Joo</i>	

(376a) Impact of Ionomer Resistance in Nanofiber-Nanoparticle Electrodes for Ultra-Low Platinum Fuel Cells	54
<i>Monica Hwang, Yossef A. Elabd</i>	
(376b) Plant Cell Wall Inspired Nanoscale Materials for Renewable Energy Applications	55
<i>Shudipto Konika Dishari</i>	
(376c) Engineering High Performance and Durable PGM-Free Electro-Catalysts for Oxygen Evolution Reaction in PEM Water Electrolysis	56
<i>Shrinath Ghadge, Oleg Velikokhatnyi, Moni Kanchan Datta, Prasad P. Patel, Prashant Kumta</i>	
(376d) Electroactivity and Stability Analysis of Nickel Oxide Nanoclusters Deposited on Graphene with Ball Milling and Microwave-Assisted Deposition for Glucose Sensing and Fuel Cells	57
<i>Matthew DeCuir, Ram B. Gupta</i>	
(376e) A Combined High-Throughput Computing and Machine Learning Study Reveals Hydrogen Storage Performance Ceilings of Metal-Organic Frameworks	58
<i>Alauddin Ahmed, Donald J. Siegel</i>	
(440a) Designing Light Propelling Nanomotors	59
<i>Jinyao Tang</i>	
(440b) Improving Electron Transport in TiO₂ Electrode Via Nanostructure Engineering	60
<i>Bin Liu</i>	
(440c) Silicon-Based Infrared Photodetectors Enabled By Hot Electrons	61
<i>Seok Jun Han, Sang Eon Han</i>	
(440d) Enhancing Light Absorption and Emission in Quantum Dot Solids Using Al Nanostructures	62
<i>Matthew K. Quan, Vivian E. Ferry</i>	
(440e) Precise Control over the Morphology and Dopant Distribution in Colloidal Metal Oxide Nanocrystals	63
<i>Ajay Singh, Delia J. Milliron</i>	
(495a) Enhanced Optoelectronic Functionality of Photovoltaic 2D Crystal-Nanoantenna Hybrids	64
<i>D. Keith Roper, Gregory T. Forcherio, Jeremy Dunklin, Mourad Benamara, Luigi Bonacina, Yana Vaynzof, Claudia Backes</i>	
(495b) High-Efficiency Dynamic Lighting with Transition Metal Elements As Sensitizers	65
<i>Pragathi Darapaneni, Raju Kumal, Alexander Meyer, Mohammad Saghayezhian, Louis Haber, Kenneth Lopata, Ward Plummer, Yuanbing Mao, James Dorman</i>	
(495c) Mechanism and Design Principles for Directing Energy Flow in Multicomponent Plasmonic Systems	66
<i>Steven Chavez, Umar Aslam, Suljo Linic</i>	
(495d) Semiconducting Halide Perovskite Nanomaterials and Heterojunctions	67
<i>Letian Dou</i>	
Author Index	