

# **Environmental Division 2015**

Core Programming Area at the 2015 AIChE Annual Meeting

Salt Lake City, Utah, USA  
8-13 November 2015

ISBN: 978-1-5108-1859-0

**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© (2015) by AIChE  
All rights reserved.

Printed by Curran Associates, Inc. (2016)

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](http://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: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## TABLE OF CONTENTS

<b>(8b) Thermophilic Anaerobic Digestion of Mixed Substrates: The Effect of Commercial Enzymes Addition in the Efficiency of the Process .....</b>	1
<i>Ioannis Zarkadas, Fokion Kaldis, Petros Katapodis, George Pilidis, Dimosthenis Sarigiannis</i>	
<b>(8c) Bio-Methanation of Fur Farming Wastes Under Mesophilic Conditions: Focusing on Methane Potential and Volatile Solids Reduction .....</b>	3
<i>Ioannis Zarkadas, Georgios Dontis, George Pilidis, Dimosthenis Sarigiannis</i>	
<b>(8d) Biogas Production and Nutrient Recovery from Batch Anaerobic Digestion of Lipid Extracted Freshwater and Marine Algal Biomass: Chlorella vulgaris and Cyclotella Sp .....</b>	4
<i>Xuwen Xiang, Tyler S. Radniecki, Altan Ozkan, Christine Kelly</i>	
<b>(8e) Hydrogen Production Via Anaerobic Fermentation of Cornstalk .....</b>	6
<i>Chunzhao Liu</i>	
<b>(18a) Multi-Scale Approach to Fundamental Understanding of Biofilm-Mineral Interactions.....</b>	7
<i>Somayeh Ramezanian, Nehal I. Abu-Lail</i>	
<b>(18b) Mathematical Modeling of Hybrid Adsorption and Biological Treatment Systems (HABiT)s for Enhanced Nitrogen Removal .....</b>	9
<i>Karl Payne, Veronica Aponte-Morales, Laura Rodriguez-Gonzalez, Sarina Ergas, Jeffrey Cunningham, Maya Trotz</i>	
<b>(18c) Detoxification of Biomass Hydrolysates with Nucleophilic Amino Acids Enhances Microbial Fermentation .....</b>	10
<i>Maobing Tu, Rui Xie</i>	
<b>(18d) Nitrate Enhances Cell Viability and Structure Stability of Comamonas Testosteroni Biofilms .....</b>	11
<i>Yichao Wu, Bin Cao</i>	
<b>(18e) Comparison of Citric Acid Production through Milk Whey and Glucose Fermentation By Aspergillus Niger .....</b>	12
<i>Yessica Chacón Pérez, Carlos A. Cardona, Sebastián Serna</i>	
<b>(19a) Fouling of Ultrafiltration PVDF/N-TiO<sub>2</sub> Hollow-Fiber Membranes (HFM) By Transparent Exopolymer Particles (TEPS) and Its Reduction By Visible Light Irradiation.....</b>	23
<i>Zhibiao Li, Jun Yin, Baolin Deng</i>	
<b>(19b) Self-Adaptive Ultrafiltration with Optimal Coagulant Dosing .....</b>	24
<i>Larry Gao, Anditya Rahardianto, Han Gu, Panagiotis D. Christofides, Yoram Cohen</i>	
<b>(19c) Tailoring Electrode Architecture Towards Competitive Water Deionization Technologies Via Electrosorption.....</b>	25
<i>Patricia Taboada-Serrano, Xiang Li, Thomas Close, Samantha Pustulka, Scott Pedu, Christiaan Richter</i>	
<b>(19d) Microalgae Cultivation in Membrane Photobioreactors for Tertiary Wastewater Treatment.....</b>	26
<i>Prashant Praveen, Kai-Chee Loh</i>	
<b>(19e) Analytical Determination of the Baffle Factor for Disinfection Contact Systems Based on Hydraulic Analysis, Disinfection Kinetics and Ct Tables .....</b>	27
<i>John Paccione, David Dziewulski</i>	
<b>(19f) Role of Micro and Macro-Heterogeneities in Electro-Kinetic Soil Cleaning: An Area-Averaging Approach with Dynamic Simulations .....</b>	28
<i>Rocio Tijaro-Rojas, Dr. Pedro E. Arce, Dr. Yung Way Liu</i>	
<b>(53a) Identifying Reaction Regimes in Atmospheric Chemical Transport Models for Mechanism Reduction.....</b>	29
<i>Kristina Wagstrom</i>	
<b>(53b) Biogenic-Anthropogenic Interactions in Secondary Organic Aerosol Formation.....</b>	30
<i>Jianhuai Ye, Jon Abbatt, Arthur Chan</i>	
<b>(53c) Secondary Organic Aerosols (SOA) from Nitrate Radical Oxidation of Monoterpenes: Results from Recent Laboratory and Field Studies .....</b>	31
<i>Nga Lee Ng, Lu Xu, Christopher Boyd, Javier Sanchez, Sriram Suresh, Alexis Eugene, Theodora Nah, Wing-Yin Tuet, Marcelo Guzman, Hongyu Guo, Rodney Weber</i>	
<b>(53d) The Effects of Humidity Cycling on a Range of Aerosol Particles.....</b>	32
<i>Timothy Raymond, Ryan C. Snyder, Judy Phan, Dabrina Dutcher, Hemanta Timsina</i>	
<b>(53e) How Will Modern Light-Duty Diesel Vehicles Modify CCN? .....</b>	33
<i>Diep Vu, Daniel Short, Georgios Karavalakis, Thomas Durbin, Akua Asa-Awuku</i>	
<b>(53f) The Air Quality Impacts of Hydraulic Fracturing Flowback Fluid .....</b>	34
<i>Jeff Bean, Lea Hildebrandt Ruiz</i>	

<b>(53g) Selective Catalytic Reduction of NO with NH<sub>3</sub> over Bimetallic Composite Catalysts Ce/Cu-SSZ-13 .....</b>	37
<i>Ranran Zhang, Yonghong Li</i>	
<b>(53h) Physical Nanostructure By HRTEM and Chemical Bonding By XPS: Fingerprinting Carbonaceous Aerosols .....</b>	40
<i>Vander Wal Randy, Chethan Kumar Gaddam, Chung-Hsuan Huang</i>	
<b>(91a) Novel Processes for the Production of Olefins and Aromatics from Methane Via Methanol: A Comprehensive Process Synthesis and Global Optimization Approach .....</b>	41
<i>Alexander M. Niziolek, Onur Onel, Christodoulos A. Floudas</i>	
<b>(91b) Process Design and Optimization of Chemicals' Production from Biomass Feedstocks .....</b>	42
<i>Zhaojia Lin, Abhay Athaley, Vladimiros Nikolakis, Marianthi G. Ierapetritou</i>	
<b>(91c) A Review on Life Cycle Assessments of Prioritized Renewable Chemicals and Their GHG Reduction Potential .....</b>	44
<i>Mahdokht Montazeri, George G. Zaines, Vikas Khanna, Matthew J. Eckelman</i>	
<b>(91d) Process Simulation Models Parameterizing Multi-Sector Technoeconomic Framework to Test Viability of Emerging Bioprocesses .....</b>	47
<i>Sumesh Sukumara</i>	
<b>(91e) Biolubricant: Lignin in Choline/Amino Acid Ionic Liquids .....</b>	48
<i>Liwen Mu, Jiahua Zhu</i>	
<b>(98a) Water Desalination By Shock Electrodialysis .....</b>	49
<i>Nancy Lu</i>	
<b>(98b) Exergy Analysis of a Power Plant in Abu Dhabi (UAE) .....</b>	50
<i>Abdullah Alhosani</i>	
<b>(98c) Insights into the Hydrothermal Stability of ZSM-5 Under Relevant Biomass Conversion Reaction Conditions .....</b>	51
<i>David W. Gardner</i>	
<b>(98d) Effects of Season and Heating Mode on Ignition and Burning Behavior of Ten Species of LIVE FUEL Measured in a FLAT-Flame Burner System .....</b>	52
<i>Samantha Smith</i>	
<b>(98e) Characterization and Particle Sizing of the Composition of E-Cigarette Aerosol .....</b>	61
<i>Jordan Berger</i>	
<b>(98f) Ammonia Removal from Aquaculture Stocking Water .....</b>	62
<i>Martin C</i>	
<b>(98g) Impact of Chemical Dopants and Passivation Schemes on Carbon Nanotube Sheet Conductivity .....</b>	63
<i>Colleen C. Lawlor</i>	
<b>(98h) ïœefilms: Dynamics of Thin-Films Under Physiological Fluids and Shear Flow .....</b>	64
<i>Monica Torralba</i>	
<b>(98i) Photocatalytic Methanol Reforming on TiO<sub>2</sub> .....</b>	65
<i>Katelyn Dagnall</i>	
<b>(98j) Room Temperature Shape Memory Polymers .....</b>	66
<i>Heather Fairbairn</i>	
<b>(130a) Modeling and Control of the Heavy Duty Automotive SCR Catalyst .....</b>	67
<i>Andreas Åberg, Anders Widd, Jens Abildskov, Jakob Kjøbsted Huusom</i>	
<b>(130b) Pilot Reactor Studies on a Low Temperature Soot Oxidation Catalyst .....</b>	68
<i>James Zokoe</i>	
<b>(130c) Spatio-Temporal Features of Lean NO<sub>x</sub> Reduction in the NSR+SCR Sequential Configuration .....</b>	69
<i>Mengmeng Li, Vencon Easterling, Michael P. Harold</i>	
<b>(130d) Fabrication and Characterization of Ultrasmall Au–Cu Nanoalloy Clusters Encapsulated By Silica for High Temperature Catalysts .....</b>	74
<i>Navid Zanganeh, Hossein Toghiani, Kalyan K Srinivasan, Sundar Rajan Krishnan, Jason M. Keith</i>	
<b>(130e) Fundamental Understanding of Spinel Stabilized Metal Catalysts .....</b>	75
<i>Lei Nie, Yingwen Cheng, Qixia Cai, Donghai Mei, Yong Wang</i>	
<b>(148a) Conceptual Process Design and Economic Analysis for Biomass Conversion Technologies to Valuable Chemicals .....</b>	76
<i>Yonggang Gao, Yongliang Chua, Pavan Kumar Naraharisetti, Daniel Gait Anak Kumbang, Tze Yuen Yeo, Arief Adhitya, Paul Sharratt, Jie Bu</i>	
<b>(148b) Scenarios Simulation and Forecast of Urban Economy-Resources-Environment System By Using System Dynamics Model .....</b>	83
<i>Dongjie Guan</i>	
<b>(148c) Energy Integration Alternatives for Effective Use of Waste Heat Associated with Flaring during Abnormal Situation .....</b>	84
<i>Monzure-Khoda Kazi, Fadwa T. Eljack</i>	

<b>(148d) A Case for Integrated Process Engineering .....</b>	86
<i>Yizi Zhu, Chih Ning Kuan, Josh Taylor</i>	
<b>(159a) Suppression of Infrared Absorption in Nanostructured Metals By Controlling Faraday Inductance and Electron Path Length .....</b>	87
<i>Sang Eon Han</i>	
<b>(159b) Plasmon-Enhanced Energy Transfer and Other Photophysical Effects in Doped-Lanthanide Nanocrystals .....</b>	88
<i>Qi-C. Sun, Prashant Nagpal</i>	
<b>(159c) Quantum Dynamical Simulations of the Photoinduced Charge Transfer Process in Donor-Bridge-Acceptor .....</b>	89
<i>M. Belen Oviedo, Bryan Wong</i>	
<b>(159d) Multiple Energy “Exciton-Shelves” in Quantum-Dot-DNA Nanobioelectronic Materials .....</b>	90
<i>Prashant Nagpal, Samuel Goodman</i>	
<b>(159e) Integration of Photosystem I Proteins within Conductive Polymer Matrices Using Vapor Phase Techniques .....</b>	91
<i>Maxwell Robinson, Evan Gizzie, G. Kane Jennings, David Cliffel</i>	
<b>(170a) The Role of Carbon Dioxide As a Solvent for Greener Biodiesel Production over a Heterogeneous Catalyst .....</b>	92
<i>Lindsay Soh, Julie Zimmerman, Chun-Chi Chen</i>	
<b>(170b) New Process for Recovery of Renewable Energy and Chemicals from Black Liquor – A Review .....</b>	93
<i>Tapas Das</i>	
<b>(170c) Study of Iron Oxide Based Mixed Oxygen Carriers for in-Situ Tar Cracking in Biomass Chemical Looping .....</b>	94
<i>Ankita Majumder, Elena Y. Chung, L.-S. Fan</i>	
<b>(170d) Synthesis of SBA-16 Supported Cesium Salt of Iron Substituted Lacunary Keggin Type Polyoxometalate Based Catalyst for Selective Thermal Catalytic Cracking of Low Density Polyethylene .....</b>	95
<i>Asma Tufail</i>	
<b>(170e) Energy and Carbon Foot Print Analysis of the Production of a Liquid Organic Hydrogen Carrier .....</b>	96
<i>Patrick Adametz, Karsten Müller, Raphael Lechner, Stefan Müller, Markus Brautsch, Wolfgang Arlt</i>	
<b>(170f) Process Synthesis of Flexible and Sustainable Processes Consisting of Membrane Separations and Reactive Distillation for the Production of Biodiesel .....</b>	97
<i>Kathrin Werth, Paul Behling, Annchristin Hnida, Mirko Skiborowski</i>	
<b>(188a) Using CO<sub>2</sub> to Synthesize Commodity Chemicals .....</b>	99
<i>Kara Stowers</i>	
<b>(188b) Benzomics: A High Dimensional Biology Perspective to Benzene Health Risk .....</b>	100
<i>Dimosthenis Sarigiannis, Alberto Gotti, Spyros Karakitsios</i>	
<b>(188c) Capturing Carbon Dioxide with a Green Focus .....</b>	102
<i>Pablo D. Duarte, Seth S. Gottlund</i>	
<b>(188d) Optimizing Health, Safety, and Environmental Sustainability.” Mayan Pigments: Organic/Inorganic Hybrid Materials - Art, Science, Cancer .....</b>	103
<i>Russell R. Chianelli, Gary Williams, Francia Holguin Chavoya, Siddhartha Das, Giulio Francia, Kristen Y. Gonzalez</i>	
<b>(188e) Flash Point of Petroleum Fuels: Evaluation and Predictive Methods .....</b>	104
<i>Sara S. AlQaheem, M. R. Riazi</i>	
<b>(214a) Aerosol Science and Engineering Enabling Environmental Nanotechnology .....</b>	105
<i>Pratim Biswas</i>	
<b>(218a) Solar Evaporation Enhancement Using Floating Copper Oxide Deposited Cellulose Paper .....</b>	106
<i>Amin Yousefi Booshehri, Rong Xu</i>	
<b>(218b) Bottom-up Assembly of Metal Silicide Nanowires into Highly Efficient Bulk Thermoelectrics .....</b>	107
<i>Sreeram Vaddiraju, Yongmin Kang, Venkata Vasiraju</i>	
<b>(218c) Omni-Thermoelectrics: Atomically Convertible p/n Nanowire Inks for Flexible Generators .....</b>	108
<i>Ayaskanta Sahu, Boris Russ, Miao Liu, Jason Forster, Nav Nidhi Rajput, Fan Yang, Raffaella Buonsanti, Chris Dames, Kristin Persson, Jeffrey Urban, Rachel Segalman</i>	
<b>(218d) Computational Study of Thermal Transport in Si-Ge Nanostructures - Exploration of Phonon Scattering Contributions to Suppressed Conductivity .....</b>	109
<i>Yongjin Lee, Alexander Pak, Gyeong Hwang</i>	
<b>(218e) A Comparative Study of Two Narrow Gap Semiconductors FeGa<sub>3</sub> and FeSb<sub>2</sub> .....</b>	110
<i>Lianyang Dong, Theo Siegrist</i>	
<b>(237a) In-Vitro Dewetting Dynamics on Silicone Hydrogel Contact Lenses .....</b>	111
<i>Chew Chai, M. Saad Bhamla, Gerald G. Fuller</i>	

<b>(237b) Prediction of Vapor/Liquid Characteristics By Quantum Mechanics Data.....</b>	112
<i>Marshall Knapp</i>	
<b>(237c) Effect of Electrical Field on the Effective Parameters of Non-Newtonian Fluid .....</b>	113
<i>Stephen Dueck</i>	
<b>(237d) Degradation of a Thermoplastic Polyether Ester Elastomer in Downhole Conditions .....</b>	122
<i>Cody Diaz</i>	
<b>(237e) Alternative Sampling Densities in Non-Uniform Sampling .....</b>	123
<i>Darien Craft</i>	
<b>(237f) Dynamic Light Scattering Study of Sulfonated Polystyrene Ionomers in Benzene .....</b>	124
<i>Nour Srouji</i>	
<b>(237g) A DFT Study of Methanol Reforming on C- and N-Doped TiO<sub>2</sub> (110) Rutile Surfaces .....</b>	125
<i>Jacob Massa</i>	
<b>(237h) Thermochemical Analysis of Intermolecular Vs. Intramolecular Reactions in Iridium Complexes .....</b>	126
<i>Alyssa Bienvennu</i>	
<b>(237i) Quantitative and Contextual Characterization of Plasmid Copy Number .....</b>	127
<i>Emily Miller</i>	
<b>(237j) A Novel Approach to Data Processing in High Throughput Material Science Experimentation .....</b>	128
<i>Mark Albing</i>	
<b>(248m) A Flare and Overpressure Management System: Methods, Metrics, KPIs and Software Solutions .....</b>	130
<i>Michael Marshall</i>	
<b>(248aq) Carbonaceous Aerosol: Physical Nanostructure and Chemical Analysis.....</b>	140
<i>Vander Wal Randy, Chethan Kumar Gaddam, Chung-Hsuan Huang</i>	
<b>(248v) Volumetric Properties of Binary and Ternary Mixtures of Tetrabutylphosphonium Bromide + Water + Amine.....</b>	141
<i>Laura Leticia Agaton-Márquez, Elda Patricia Neri-Calixto, Javier Verónico-Sánchez, Luis E. Camacho-Camacho, Octavio Elizalde-Solis, Abel Zuniga-Moreno</i>	
<b>(248an) Development of a New Electrode Using Polyaniline Coated Graphite and Its Application for Wastewater Treatment in a Batch Electrooxidation Unit .....</b>	148
<i>Ahmed Elshazly</i>	
<b>(248j) Simultaneous Energy Integration and Low Grade Waste Heat Recovery Technologies Targeting for Eco-Transformation.....</b>	158
<i>Mahmoud Bahy Noureldin, Badr Alzamil, Abdulaziz Nutaifi</i>	
<b>(248ad) Enhancing Selectivity of 4-Nitrophenol Degradation By Using Molecular Imprinted Codoped-TiO<sub>2</sub> Under Simulated Solar Light .....</b>	159
<i>Yanyan Wu, Xiang Liu</i>	
<b>(248ao) A Novel Y<sub>2</sub>O<sub>3</sub>-Psf Membrane for Treatment of Arsenate Contaminated Water.....</b>	160
<i>J. Paul Chen, Yang Yu</i>	
<b>(248ab) Effect of Mn Loading Onto Mnfeo Nanocomposites for the CO<sub>2</sub> Hydrogenation Reaction .....</b>	161
<i>Adel Ismail</i>	
<b>(248w) A Compact Electrochemical Cell for the Sequestration of Carbon Dioxide.....</b>	162
<i>Heung Yong Ha, Asad Mehmood, Nak Won Lee</i>	
<b>(248n) Gaseous o-Xylene Biodegradation in Two-Liquid Phase Airlift Bioreactor and Biotrickling Filter Configurations .....</b>	163
<i>Chao Wu, Wei Li</i>	
<b>(248ak) An Investigation of the Biological Risk of Ozone Treatment of EDCs Contaminated Water .....</b>	164
<i>Hyun Kyung Kim</i>	
<b>(248ag) Magnetic Adsorbents for Heavy Metal Removal from Sea Water.....</b>	165
<i>Xingqing Chen, Kailin He, King Lun Yeung</i>	
<b>(261e) Characterization of the Properties of Flame Retardant PET Composites with Different Nano-Carbons .....</b>	166
<i>Jinming Dai, Jiangfeng Yang</i>	
<b>(248q) Removal of Siloxane from Biogas By Adsorption on Mesoporous Aluminosilicate (UCT-15) .....</b>	167
<i>Ting Jiang, Wei Zhong, Tahereh Jafari, Shoucheng Du, Steven L. Suib</i>	
<b>(248o) Fe-EDTA Transformation Affecting Factors and the Cost-Optimal Operation Conditions for NO Removal in a Chemical Absorption-Biological Reduction Integrated Reactor .....</b>	168
<i>Jingkai Zhao, Yinfeng Xia, Wei Li, Chao Wu</i>	
<b>(248s) Ohio Coal Pyrolysis for Generation of Asphalt-like Materials .....</b>	169
<i>Swapnil Fegade, Jason Trembly</i>	
<b>(248ai) Removal of Carboxylic Acids from Fischer Tropsch Aqueous Product.....</b>	170
<i>Nuvaid Ahad, Arno de Klerk</i>	

<b>(248i) Dynamic Modeling and Optimization of the CCS Network in Korea.....</b>	171
<i>Changsoo Kim, Kyeongsu Kim, Chonghun Han</i>	
<b>(248p) Effect of Electrode Configuration and Power Frequency on TCE (trichloroethylene) Decomposition in a Nonthermal Plasma Reactor.....</b>	172
<i>Shinichi Toji, Masanori Ochi, Junichi Ida, Tatsushi Matsuyama, Hideo Yamamoto</i>	
<b>(248z) Limestone Modified By Carbon Additives to Enhance the Sequestration of CO<sub>2</sub> in Cement Industry .....</b>	173
<i>Binglu Meng, Hui Li, Wen-bin Yang, Jiang-feng Li, De-Long Xu, Xinkai Hou, Youhai Yu, Yong Min</i>	
<b>(248aa) The Enhancement of CO<sub>2</sub> Sequestration of Limestone By Modified with Attapulgite .....</b>	174
<i>Liyuan Shan, Hui Li, Jingjing Meng, Binglu Meng, Jiang-feng Li, De-Long Xu, Xinkai Hou, Youhai Yu, Yong Min</i>	
<b>(248d) Optimal Wastewater Stabilization Ponds System Design.....</b>	175
<i>Maria P. Ochoa, Vanina Estrada, Patricia M. Hoch</i>	
<b>(248a) Combined Use of Dimensionality Reduction and Surrogate Modelling for the Multi-Objective Optimization of Buildings .....</b>	176
<i>Joan Carreras, Carlos Pozo, Dieter Boer, Gonzalo Guillén-Gosálbez, Jose A. Caballero, Ruben Ruiz-Femenia, Laureano Jiménez</i>	
<b>(248b) Optimization of Thermal Energy Supply By Central Solar Heating Plants with Seasonal Storage .....</b>	177
<i>Victor Tulus, Dieter Boer, Luisa Cabeza, Gonzalo Guillén-Gosálbez, Laureano Jiménez</i>	
<b>(248r) Performance of Tar Removal Filter System with Biomass-Derived Materials As Filter Medium .....</b>	178
<i>Ajay Kumar, Sunil Thapa, Prakashbhai Bhoi, Raymond L. Huhnke</i>	
<b>(248ae) Evaluation of Natural Feoooh on the Removal of Arsenic and Selenium from Produced Waters .....</b>	179
<i>Andrew Jacobson, Maohong Fan</i>	
<b>(248ap) Monitoring the Effect of Environmental Exposure on Mammalian Development.....</b>	180
<i>Oscar F. Sanchez, Chongli Yuan</i>	
<b>(248x) Carbon Dioxide Capture on Amine Modified MCM-36 .....</b>	181
<i>Christopher Cogswell, Sunho Choi</i>	
<b>(248ac) Attachment of Bacteriophage P22 to Nano Structured Iron Oxide Ceramics: Implications for Drinking Water Treatment.....</b>	182
<i>Guillermina Gentile, Maria V. Gallardo, Fernando M. Yrazu, Oscar Oppizzo, Ramon Pizarro, Hugo R. Poma, Veronica B. Rajal, Maria M. Fidalgo</i>	
<b>(248al) Modeling of Physical-Chemical Variables Behavior in Rivers Using the Streeter-Phelps MODEL .....</b>	185
<i>Mario Andres Noriega, Lady Andrea Fuertes</i>	
<b>(248c) Assessment of the Environmental Efficiency of the Electricity Mix of the Top European Economies Via Data Envelopment Analysis .....</b>	186
<i>Anna Ewertowska, Angel Galán-Martín, Gonzalo Guillén-Gosálbez, Jordi Gavaldá, Laureano Jiménez</i>	
<b>(248ar) A Semi-Analytical Method for Determining the Optimal Stripper Pressure in CO<sub>2</sub> Capture and Liquefaction Using Monoethanolamine (MEA).....</b>	187
<i>Taekyoon Park, Seok Goo Lee, Sung Ho Kim, Ung Lee, Chonghun Han, Jong Min Lee</i>	
<b>(248e) Optimal Design of Agricultural Water Networks.....</b>	188
<i>Eusiel Rubio-Castro, Maritza E. Cervantes-Gaxiola, Oscar M. Hernández-Calderón, José Francisco Hernández-Martínez, José Antonio Meza-Contreras, José María Ponce-Ortega</i>	
<b>(248af) Osmosis Membrane Bioreactor for the Removal of 3-Chloroaniline .....</b>	196
<i>Duong TT Nguyen, Prashant Praveen, Kai Chee Loh</i>	
<b>(248am) Analysis of Chemical Contaminants in Campus Stormwater Runoff Using Cameras and Chemical Samplers, Phase I: Preliminary Research .....</b>	197
<i>Dana Lackey, Dr. Robert W. Peters, Jason T. Kirby</i>	
<b>(248y) Energetic and Solvent Needs Analysis for the CO<sub>2</sub> Capture Process from the Flue Gas Originated from Natural Gas Combustion in Boilers By Chemical Absorption with Ethanolamines .....</b>	198
<i>Maristhela P. de A. Marin, Newton Libanio Ferreira, Ana Paula de Queiroz, Juliana Tacacima, Pedro Lucas Attico Fortini, Elidiane da Silva Lima, Fernanda Mayumi Laurindo</i>	
<b>(248f) An MINLP Model for Sustainable Water Management in Macroscopic Systems: Integrating Optimal Resources Management to the Synthesis of Distributed Treatment Systems .....</b>	199
<i>Vicente Rico-Ramirez, Jose Maria Ponce-Ortega, Jaime Garibay-Rodriguez</i>	
<b>(248u) The Clathrate Hydrate Process for Pre-Combustion Carbon Capture.....</b>	200
<i>Ponnivalavan Babu, Praveen Linga</i>	
<b>(248aj) La- and Cr- Doped SrTiO<sub>3</sub> Nanoparticles for Photocatalytic Pollutant Degradation .....</b>	201
<i>Ivan Davila, Vladimir Yefremov, Karen S. Martirosyan</i>	
<b>(248au) Three-Dimensional CFD Analysis of Hydrodynamics and Concentration Polarization in an Industrial RO Feed Channel.....</b>	202
<i>Mingheng Li, Weihua Wu, Hien Nguyen, Nhu Quynh Nguyen, Eric Pearce</i>	

<b>(248g) Environmental Impacts of a Natural Gas Dehydration Plant- Simulation and Process Optimization</b>	203
<i>Mehdi Amouei Torkmahalleh, Milad Malekipirbazari</i>	
<b>(248at) Fate of Rare Earth Elements during Lab-Scale Combustion of Lignite Coal</b>	208
<i>Elliot Roth, Murphy J. Keller, Tracy Bank, Evan J. Granite</i>	
<b>(248k) Black and Grey Box Modeling of Hydrocarbon Physiochemical Properties</b>	209
<i>Andrew Yueh, Mahmoud El-Halwagi, Faruque Hasan, Nimir O. Elbashir, Ashraf Ibrahim</i>	
<b>(248ah) Development of Functionalized Nanofiber Membrane for Purification of Contaminated Water</b>	210
<i>Yasuhiro Mukai</i>	
<b>(248as) Synthesis of Layered Double Hydroxides Intercalated with Chelating Agents for RARE Earth Element Capture from Aqueous Streams</b>	214
<i>Ashley LeDonne, Elliot Roth, Jonathan W. Lekse, Evan J. Granite</i>	
<b>(248t) Simulation of a Novel Low NO<sub>x</sub> Burner for Low Grade Coal</b>	215
<i>Jing Wang, Lan Liu, Helen Lou, Fangqin Cheng</i>	
<b>(248av) Removal of recalcitrant aromatic organic compounds from wastewater using fungi</b>	223
<i>Mostafa Zahmatkesh</i>	
<b>Sustainability of Road Materials</b>	226
<i>Pedro Romero</i>	
<b>(261b) Use of MULTI-Wall Carbon Nanotubes in Cement-Based Materials for the REAL-Time Monitoring of SMART Structures</b>	227
<i>Stephanos F. Nitodas, Stavros K. Kourkoulis, Zoi Metaxa, Nikolaos D. Alexopoulos, Spyridoula Boutsikou, Paraskevi Mimitigiani</i>	
<b>(261c) Stimuli Responsive Elastomer Based Hybrids with Tunable Multi-Functionality</b>	229
<i>Songshan Zeng, Wenhan Huang, Helen Nguon, Andrew Smith, Luyi Sun</i>	
<b>(261d) Porous Ceramic Foams By Emulsified Alumina Powder Suspensions in Water</b>	230
<i>Jesus G. Perez, Oscar Alberto Alvarez, Jairo A. Escobar, Juan C. Nino</i>	
<b>(261e) Thermal Stability and Flame Retardant Polypropylene Nanocomposites</b>	231
<i>Qingliang He, Honglin Qu, Jiang Guo, Zhanhu Guo</i>	
<b>(288a) CFD Modeling of Soot Emission and Flare Efficiencies for Controlled Flare Tests</b>	232
<i>Vijaya Damodara, Daniel H. Chen, Helen H. Lou, Hashim Almrayani, Ajit Patki, Arokiaraj Alphones, Xianchang Li, Christopher B. Martin, Matthew R. Johnson</i>	
<b>(288b) Quantitative Risk Assessment of Underground Propylene Pipeline: Deterioration and Corrosion Effects</b>	247
<i>Seolin Shin, Gunhak Lee, Ezgi Darici, Chul-Jin Lee, Chonghun Han</i>	
<b>(288c) Assessment of the Integrated Health Effects of Airborne Industrial Emissions Based on the Chemical Mixture Methodology</b>	248
<i>Mohamed Ahmed Mahmoud Taha, Konstantinos E. Kakosimos</i>	
<b>(288d) PAH Exposure and LUNG Cancer Risk Assessment By Internal Dosimetry Metrics</b>	249
<i>Dimosthenis Sarigiannis, Dimitrios Zikopoulos, Spyridoula Nikolaki, Marianthi Kermenidou, Spyros Karakitsios</i>	
<b>(288e) A Flare and Overpressure Management System - Methods, Metrics, KPIs and Software Solutions</b>	251
<i>Michael Marshall</i>	
<b>(288f) A General Model for Estimating Air Emissions in Petroleum Refineries Using Emission Factors Technique</b>	261
<i>Mohammad M. Bashammakh</i>	
<b>(291a) Effect of Temperature and Pressure on Reaction Kinetics of Powder River Basin Coal Gasification in Carbon Dioxide and Steam</b>	262
<i>Ying Wang, David A. Bell</i>	
<b>(291b) Adsorption-Desorption Behavior and Mechanism of Dimethyl Disulfide in Hydrocarbon Liquid on Ion-Exchanged Y Zeolites</b>	263
<i>Dezhi Yi, Li Shi, Xuan Meng</i>	
<b>(291c) N Doped TiO<sub>2</sub> for Photocatalytic Oxidation of CO in Visible Region Synthesized By Novel One Step Liquid Flame Spray Pyrolysis (LFSP): Kinetics and Mechanism</b>	264
<i>Siva Nagi Reddy Inturi, Makram Suidan, Panagiotis Smirniotis</i>	
<b>(291d) Synthesis of Reactor Networks Featuring Minimum Number of Units and Network Volume Constraints</b>	265
<i>Abdulrahman Albassam, Vasilios Manousiouthakis</i>	
<b>(291e) Reaction Mechanism of the Oxidative Decomposition of Organochlorine Compounds By Fenton-like Reaction in Subcritical Water</b>	266
<i>Noritsugu Kometani, Reina Takami</i>	

<b>(291f) Optimization of Titanium Dioxide Nanotubes for Bacterial Inactivation .....</b>	274
<i>Casey Elliot, Krista Carlson, Manoranjan Misra, Swomitra Mohanty</i>	
<b>(324a) Membrane Integrity Monitoring in Multi-Element Spiral-Wound RO/NF Plant .....</b>	275
<i>Anditya Rahardianto, Sirikarn Surawanvijit, Yoram Cohen</i>	
<b>(324b) An Integrated Membrane Bioreactor System for Low-Energy Wastewater Treatment .....</b>	276
<i>Sage R. Hibel, Amy E. Childress, Eric A. Marchand, Andrea Achilli, Chanwoo Park</i>	
<b>(324c) Development of Supported Solid Nanoparticles and Process for Hydrocarbon Recovery and Enhancing Water Recyclability from SAGD Wastewater.....</b>	277
<i>Amjad El-Qanni, Nashaat N. Nassar, Gerardo Vitale</i>	
<b>(324d) Towards Greener Fabrication of Polymeric Membranes: Recycling Membrane Wastewater .....</b>	278
<i>Gyorgy Szekely</i>	
<b>(324e) Hybrid Osmotic Membrane Bioreactor for Municipal Wastewater Treatment, Water Reclamation and Resource Recovery.....</b>	281
<i>Guanglei Qiu, Srinivasa Raghavan Divya Shankari, Yen-Peng Ting</i>	
<b>(324f) Destabilization and Treatment of Produced Water-Oil Emulsions Using Different Charge Density of Anionic Polyacrylamides.....</b>	282
<i>A. S. Sultan, He MA, Mustafa Nasser</i>	
<b>(326a) Integration of Wind and Solar Energy within Continental Biorefinery Supply Network .....</b>	283
<i>Lidija Cucek, Mariano Martín, Zdravko Kravanza</i>	
<b>(326b) Multi-Scale Exploration of the Technical, Economic, and Environmental Dimensions of Bio-Based Chemical Production .....</b>	284
<i>Kai Zhuang, Markus J. Herrgård</i>	
<b>(326c) The Impact of Natural Gas and Natural Gas Liquids Supplies on the United States Chemical Manufacturing Industry .....</b>	285
<i>Sean DeRosa, David T. Allen</i>	
<b>(326d) Multi-Objective Optimization Applied to Sustainable Rain-Fed and Irrigated Crop Production: A Case Study of Wheat Production in Spain.....</b>	286
<i>Ángel Galán Martín, Pavel Vaskan, Gonzalo Guillén-Gosálbez, Assumpció Antón Vallejo, Laureano Jiménez Esteller</i>	
<b>(326e) 3E (Engineering-Environmental-Economic) Triangle Model for Optimization of High-Gravity Carbonation Process: Establishment of Waste-to-Resource Supply Chain.....</b>	287
<i>Shu-Yuan Pan, Ana Maria Lorente Lafuente, Yupo J. Lin, Shu-Hui Hung, Pen-Chi Chiang</i>	
<b>(326f) Using Sustainability Footprint in Optimization Framework for Prospective Design of Chemical Processes.....</b>	288
<i>Alessandra R. Carreon, Rajib Mukherjee, Subhas Sikdar, Mahmoud El-Halwagi</i>	
<b>(326g) A Pseudo-Equilibrium Approach for Process-to-Planet Design Under Environmental Tax Policies .....</b>	289
<i>Rebecca Hanes, Bhavik R. Bakshi</i>	
<b>(364f) Alternative Ammonia Storage Materials for SCR of NOx .....</b>	304
<i>Chinmay Deshmankar, Abhi Karkamkar</i>	
<b>(364c) Self-Template Porous Carbons Derived from Metal-Organic Framework: Synthesis, Characterization and Adsorption Properties .....</b>	305
<i>Shuguang Deng, Jun Wang, Jiangfeng Yang</i>	
<b>(364b) Nanocomposite Particle Synthesis Using Switchable Ionic Liquids (SWILs) .....</b>	306
<i>Nune Satish, David J. Hellebrant, David Lao, Jian Liu, Ravi Kukkadapu, Matthew Olszta, Manjula Nandasiri, Lyle Gordon</i>	
<b>(364e) Pilot-Scale Multistage Fluidized Bed Adsorber .....</b>	307
<i>Pooya Shariaty, Samineh Kamravaei, Saeid Niknaddaf, Zaher Hashisho, John H. Phillips, James E. Anderson, Mark Nichols, David Crompton</i>	
<b>(364a) Removal of Toxic Chemicals Using Metal-Organic Frameworks .....</b>	308
<i>Gregory W. Peterson</i>	
<b>(435a) One Pot Synthesis of Biobased Fuel Additive Ethyl Levulinate By Direct Transformation of Bagasse in Ethanol Media .....</b>	309
<i>Shireen Quereshi, Suman Dutta, Tarun Kumar Naiya</i>	
<b>(435b) Direct Conversion of Hemicellulosic Materials to Biobutanol .....</b>	317
<i>Yu Yan, Jianzhong He</i>	
<b>(435c) Co-Liquefaction of Mixed Culture Microalgal Strains Under Subcritical Water Conditions .....</b>	318
<i>Kodanda Phani Raj Dandamudi, Tapaswy Muppaneni, Darius J. Norris, Nilusha Sudasinghe, Tanner Schaub, Francisco Holguin, Shuguang Deng</i>	
<b>(435d) Improved Estimates of Air Pollutant Emissions from Biorefinery .....</b>	319
<i>Eric C. D. Tan</i>	
<b>(435e) Analysis of Environmental Impacts Derived from Burning of the Sugar Cane Bagasse.....</b>	334
<i>Lucas B. Rocha, Marcelino L. Gimenes, Laureano J. Esteller, Carmen M. Torres</i>	

<b>(440a) Manage Water Quality at ABU-Rawash WWTP, Egypt</b>	335
<i>Dr. Mohamed Mostafa, Dr. Robert W. Peters</i>	
<b>(440b) Optimal Design of Water Distribution Networks Involving Power Production and Seawater Desalination</b>	341
<i>Ramon Gonzalez-Bravo, Fabricio Nápoles-Rivera, Mahmoud El-Halwagi, José María Ponce-Ortega</i>	
<b>(440c) Effect of Different Objectives in Optimal Sensor Placement on Water Network System with Better Optimization of Non-Linear Uncertain Systems (BONUS) Algorithm</b>	342
<i>Rajib Mukherjee, Urmila Diwekar, Ashok Vaseashta</i>	
<b>(440d) Design and Fabrication of a Lab-Scale Multiple Effect Distillation (MED) Unit to Investigate Different Water Chemistry and Scaling Behavior</b>	343
<i>Ali Amiri, Yunhe Zhang, Catherine E. Brewer</i>	
<b>(440e) Monitoring and Parameter Estimation in Ecological Models Including Fish Balances for Lake Restoration Planning with Dynamic Optimization Techniques</b>	344
<i>Vanina Estrada, Jimena A. Di Maggio, Fabian Grosman, Pablo Sanzano, Viviana Colasurdo, Marta Crisafulli, Guillermo Jelinsky, Jose Guerrero, Juan Baglivi, Laura Fritz, Monica Hoffmeyer, Maria Soledad Diaz</i>	
<b>(440f) Kinetic Modelling and Simulation of Anaerobic Digestion of Industrial Effluent and Sludge</b>	346
<i>Pooja Sharma, U. K. Ghosh, A. K. Ray</i>	
<b>(440g) Mathematical Model for Heat Integrated Water Network Systems</b>	347
<i>Ali Almansoori, Anoop Jagannath</i>	
<b>(444a) Photoelectrocatalytic Degradation of Organics in Water Using TiO<sub>2</sub> Nanotubes</b>	353
<i>Shawn Walker, Julian Tamillos, Krista Carlson, Manoranjan Misra, Swomitra Mohanty</i>	
<b>(444b) “Role of Pulsed Coronas Discharges in Mining Processing Decontamination- an Example from Copper Mining in Chile”</b>	354
<i>Pedro E. Arce, Katherine Cerdá</i>	
<b>(444c) Arsenic Reduction from Contaminated Groundwater of an Industrial Site By Advanced Oxidation Process</b>	355
<i>Tapas Das, Kashinath Banerjee</i>	
<b>(444d) Removal of Volatile Organic Sulphur Compounds By Solar Advanced Oxidation Technologies and Bioprocesses Oxidation Treatment of Volatile Organic Sulphur Compounds</b>	356
<i>Fares Almomani, Rahul Bhosale, Anand Kumar</i>	
<b>(444e) Plasma-Based Water Treatment: An Effective Method to Degrade Perfluorooctanoic Acid and Other Emerging Contaminants</b>	368
<i>Selma Mededovic Thagard, Fei Dai, Gunnar Stratton, Thomas Holsen, Eric Dickenson, Christopher Bellona, Tapas Das</i>	
<b>(444f) Electrochemical Wastewater Treatment: Oxidation of Persistent Wastewater Constituents</b>	369
<i>Dieter Woisetschläger, Bernd Humpl, Michael Koncar, Wolfgang Glasl, Matthias Siebenhofer</i>	
<b>(456a) Formation of N-Nitrosamines from Amino Acids in Post-Combustion Carbon Dioxide Capture Systems</b>	381
<i>Kun Yu, Ning Dai</i>	
<b>(456b) Investigation of Aminopolymer Loading on the MCM-36 Crystal for CO<sub>2</sub> Capture</b>	382
<i>Christopher Cogswell, Sunho Choi</i>	
<b>(456c) Tetraethylenepentamine Supported with Kaolin for CO<sub>2</sub> Capture</b>	383
<i>Maryam Irani, Maohong Fan</i>	
<b>(456d) Detailed Analysis of Foam Bioreactor Using Escherichia coli Expressing Carbonic Anhydrase for Optimization of CO<sub>2</sub> Capture</b>	384
<i>Eunsung Kan, Stuart Watson</i>	
<b>(456e) Development of a New Type of Accelerated Mineral Carbonation Process</b>	385
<i>Akihiro Yamasaki, Atsushi Iizuka, Miyuki Noguchi, Yuu Tahara, Daiki Shuto, Motoki Inoue, Hiroki Nagasawa, Yurina Nakamura</i>	
<b>(456f) Investigation of the CO<sub>2</sub> Capture of Flue Gas By Ca-Based Sorbents from Cement Industrial</b>	386
<i>De-Long Xu, Hui Li, Xinkai Hou, Youhai Yu, Liyuan Shan, Jingjing Meng, Yong Min</i>	
<b>(456g) Understanding Mechanisms of CO<sub>2</sub> Capture into Monoethanolamine Solution with Different CO<sub>2</sub> Loading</b>	387
<i>Bihong Lv, Zuoming Zhou, Guohua Jing</i>	
<b>(466a) Increase the Feeding Value of Corn Ethanol Coproducts Via Genetic Engineering of Yeast</b>	388
<i>Yanmei Zhang, Aravindan Rajendran, Cristiano E. R. Reis, Yan Yang, Mi Yan, Hongjian Lin, Jing Gan, Xin Zhang, Bo Hu</i>	
<b>(466b) Towards Biofuel Production in Synechocystis Sp. PCC 6803: Expanding the Molecular Biology Toolbox for Pathway Engineering</b>	389
<i>Christie A.M. Peebles</i>	
<b>(466c) Effect of Different Feeding Strategies of Glucose and Short-Chain Carboxylic Acids on the Production of Natamycin By Streptomyces Natalensis</b>	390
<i>Elsayed A Elsayed, Mohamed Farid, Mohammad Wadaan, Hesham EL Enshasy</i>	

<b>(466d) Systematic Characterization of a Panel of Strong Promoter/Terminator Pairs to Facilitate Scheffersomyces Stipitis Engineering.....</b>	391
<i>Meirong Gao, Mingfeng Cao, Zengyi Shao</i>	
<b>(466e) Isotopically Nonstationary 13C Flux Analysis of Isobutyraldehyde Production in Synechococcus Elongatus .....</b>	392
<i>Lara J. Jazmin, Adeola O. Adebiyi, Carl H. Johnson, Yao Xu, Jamey D. Young</i>	
<b>(469a) Application of Sub-Microfluidic Devices in Water Filtration Processes to Investigate the Removal of Pathogens .....</b>	393
<i>Nil Tandogan, Bowen Huo, Edgar D. Goluch</i>	
<b>(469b) Electrocatalytic Inactivation of E. coli in Point of Use Drinking Water Applications Using TiO<sub>2</sub> Nanotubes .....</b>	394
<i>Jeff Huber, Krista Carlson, Manoranjan Misra, Swomitra Mohanty</i>	
<b>(469c) Stability of Carbon Dots in Natural Waters: Implications for Sensing and the Environment .....</b>	395
<i>Maria M Fidalgo, Austin Zambrana, Chloe Rees</i>	
<b>(469d) Experimental Studies Using Ultraviolet-Visible Spectroscopy on Synthesized Nanoparticles .....</b>	401
<i>Muhammad Nuru Idris</i>	
<b>(469e) Immobilization and Catalytic Activity of Lipase on Modified MWCNT for Oily Wastewater Treatment.....</b>	430
<i>Ali Alshami, Ammar Jamie, Zuhair Maliabari, Muataz Ateih, Muataz Ateih, Othman al-Hamouz</i>	
<b>(469f) Qualitative Synthesis of Nanoparticles Using FTIR Spectroscopic Analysis .....</b>	431
<i>Muhammad Nuru Idris</i>	
<b>(469g) Hydrogen Peroxide Stability in Silica Hydrogels .....</b>	432
<i>Nese Orbey, Fulya Sudur</i>	
<b>(497a) Assessment of the CO<sub>2</sub> Capture Potential from Irreplaceable Industrial Sources.....</b>	440
<i>Peter C. Psarras, Jennifer Wilcox</i>	
<b>(497b) Strategic Planning and Market Analysis; How the Natural Gas Futures Market Will Need Solar Power to Complement Texas State Power Grid Demands.....</b>	441
<i>Zohreh Ravaghi, Massimiliano Kolbe</i>	
<b>(497c) IRI2038 Futures Study: A Journey into the Future of R&amp;D Management .....</b>	442
<i>Lee Green, Ted Farrington, Christian Crews, Edward Bernstein, Anthony Nickens</i>	
<b>(497d) Disaster Risk Hydrometeorological : Case Xalapa, Veracruz.....</b>	443
<i>Yair Cruz, Hever Honorato-Cervantes, Jose J. Castro, Enrique Rico</i>	
<b>(497e) Integrated Process Analysis and Design for Sustainable Local Resource Management .....</b>	444
<i>Elias Martinez Hernandez, Aidong Yang, Melissa Leung PAH Hang, Matthew Leach</i>	
<b>(506a) Hybrid Advanced Oxidation Process-Ultrafiltration Polysulfone Membrane: Application to Industrial Waste Water Treatment.....</b>	445
<i>Negin Koutahzadeh, Milad R.Esfahani, Pedro E. Arce, Holly A. Stretz</i>	
<b>(506b) Advanced Oxidation Pre-Treatment of Benzalkonium Chlorides Prior to Biological Treatment .....</b>	446
<i>Adnan H. Khan, Jing Wan, Mark Sumarah, Sheila M. Macfie, Madhumita B. Ray</i>	
<b>(506c) Advanced Oxidation Processes Involving Ultrasound and Cavitation for Environmental Remediation: Recent Technical Developments, Cost Estimation and Economic Feasibility.....</b>	456
<i>Yusuf G (Debo) Adewuyi, Dr. Robert W. Peters</i>	
<b>(506e) Multifunctional GO-COOH-Cu Nanocomposite with Enhanced Photocatalytic Activity Under Solar Light Irradiation.....</b>	457
<i>Shuyan Yu, Xiaoli Yan</i>	
<b>(506f) Application of Ozonation, Electrolysis, and UV for Seawater Treatment .....</b>	471
<i>Youmi Jung, Minhwan Kwon, Joon-Wun Kang</i>	
<b>(527a) Prediction of Nanoparticles-Cell Association Based on Corona Proteins and Physicochemical Properties .....</b>	474
<i>Rong Liu, Yoram Cohen</i>	
<b>(527b) Characterization of Detergent Residues on Surfaces.....</b>	475
<i>Sadi Gurses, Alper Uzun, Can Erkey, Seda Kizilel</i>	
<b>(527c) Assessment on the Treatment of Carbon Soot for Activated Carbon Applications: Oxidative Stress and Apoptosis Induced in Human Cell Lines.....</b>	476
<i>Xu Zhen, Fendy Fendy, Wei Cheng Ng, Pengwei Dong, Yanjun Dai, Koon Gee Neoh, Chi-Hwa Wang</i>	
<b>(527d) Structure-Toxicity Correlations for Ni/SiO<sub>2</sub> Complex Engineered Nanomaterials Using High-Throughput Zebrafish Assays .....</b>	477
<i>Sharlee Mahoney, Michelle Najera, Qing Bai, Edward Burton, Götz Veser</i>	
<b>(527e) Size-Dependent Cellular Toxicity of Gold Nanoparticles on Human Embryonic Stem Cells .....</b>	478
<i>Fangchao Liu, Yanhua Zhang, Marie-Claude Senut, Douglas Ruden, Guangzhao Mao</i>	
<b>(527f) MicroRNAs As Biomarkers for Cytotoxicity Evaluation of Multi-Wall Carbon Nanotube .....</b>	479
<i>Qixin Wang, Chang Liu, Yun Wu</i>	

<b>(528a) Evaporation Tests Using Redc Lllw Simulant Solutions.....</b>	480
<i>Paul A. Taylor</i>	
<b>(528b) Aspen/Oli Model of Waste Evaporation and Neutralization Process for Mox Waste Solidification Building.....</b>	481
<i>James E. Laurinat</i>	
<b>(528c) Small Scale Testing of a Floating Ion Exchange Bed for Nuclear Waste Treatment.....</b>	491
<i>Charles A. Nash, M. R. Williams</i>	
<b>(528d) Characterization of the Next Generation Solvent Used to Remove Cesium at the Savannah River Site.....</b>	492
<i>Fernando Fondeur</i>	
<b>(528e) Innovative Idea to Accelerate Tank Closure in Doe Savannah River Site.....</b>	493
<i>Robert C.W. Chang, Peter Hill, Aaron Staub</i>	
<b>(554a) Separation of Fine Oil Droplets from Oil-in-Water Mixtures By Dissolved Air Flotation .....</b>	503
<i>Aliff Radzuan Bin Mohamad Radzi</i>	
<b>(554b) Modeling of Complex Bio Systems Using Batchreactor.....</b>	504
<i>Olivier Baudouin, Xuan M. Meyer, Stéphane Dechelotte, Cedric Brandom, Philippe Guittard, Rodolphe Sardeing, Benjamin Wincure</i>	
<b>(554c) Oxygen Transfer Rate Effect on Pigment Production By Penicillium Purpurogenum GH2 in Shake Flask Cultures.....</b>	505
<i>Lourdes Morales-Oyervides, J. C. Montanez, Alejandro Mendez-Zavala</i>	
<b>(554d) Experimental Orders on an Entrepreneurial Pace: Dairy Wastewater Characterization Control Using Sequenced Blending.....</b>	506
<i>Christina M. Borgese</i>	
<b>(554e) Chemical Mapping of Sweeteners and Additives in Commercial Chewing Gums Using Imaging FTIR Spectroscopy .....</b>	507
<i>Ramazan Kizil</i>	
<b>(556a) Comparison of Life-Cycle Carbon Footprint of Fischer-Tropsch Diesel Versus Ultra-Low Sulfur Diesel .....</b>	509
<i>Alessandra R. Carreon, Mahmoud El-Halwagi</i>	
<b>(556b) Assessment of the Sustainability-Potential of Adipic Acid Processes .....</b>	510
<i>John R. Schlup, Oguz B. Kurtulan</i>	
<b>(556c) Resource and Techno-Economic Analysis of Biogas from WWTP (WasteWater Treatment Plants) Biosolids Using Anaerobic Digestion.....</b>	511
<i>Ling Tao, Jeongwoo Han, Jennifer Markham, Yanan Zhang</i>	
<b>(556d) Optimization of Two-Dimensional Hoist Scheduling and Production Line Design for Multi-Stage Material Handling .....</b>	512
<i>Honglin Qu, Qiang Xu</i>	
<b>(556e) Tracking of Flare Streams Emissions and Tax Implication during Process Abnormal Situations .....</b>	513
<i>Fahd M. Mohammed, Monzure-Khoda Kazi, Ahmed AlNouss, Fadwa T. Eljack</i>	
<b>(584a) Modeling of Mercury Capture By CuCl<sub>2</sub>-Impregnated Activated Carbon Sorbent in Fabric Filter .....</b>	514
<i>Xin Li, Joo Youp Lee, Vishnu Sriram</i>	
<b>(584b) Mercury Removal in a Coal-Fired Power Plant Using SO<sub>3</sub>-Tolerant Sorbents .....</b>	515
<i>Noah D. Meeks, Ramsay Chang</i>	
<b>(584c) Investigation of Sulfur Adsorption on Fly Ash for Oxy-Combustion .....</b>	516
<i>Benjamin Galloway, Bihter Padak</i>	
<b>(584d) Effect of Operational Parameters on the Performance of a Multistage Fluidized Bed Adsorber .....</b>	517
<i>Samineh Kamravaei, Pooya Shariaty, John D. Atkinson, Zaher Hashisho, John H. Phillips, James E. Anderson, Mark Nichols, David Crompton</i>	
<b>(584e) Ammonia-Modified Activated Carbon Adsorbents for Selective CO<sub>2</sub> Adsorption .....</b>	518
<i>Melek Selcen Basar, Burcu Selen Çağlayan, A. Erhan Aksoylu</i>	
<b>(585a) Prediction of Radiolytic Benzene Generation in a Waste Tank at the Savannah River Site .....</b>	521
<i>Thong Hang, Thomas B. Peters</i>	
<b>(585b) Pilot-Scale Filter Testing of a Process to Treat Radioactive Liquid Waste.....</b>	522
<i>Michael Poirier, P. R. Burkett</i>	
<b>(585c) Preparation of Geopolymers from Wastes .....</b>	523
<i>Miyuki Noguchi, Motoki Inoue, Akihiro Yamasaki</i>	
<b>(585d) Technical Bases for the DWPF Melter Off-gas Flammability Control under the Glycolic-Acid Flowsheet.....</b>	524
<i>Alexander S. Choi, John R. Zamecnik, Fabienne Johnson</i>	

<b>(585e) A Better Understanding for Cold-Cap Reactions of Nuclear Waste Feeds through Quantitative Evolved Gas Analysis .....</b>	540
<i>Jaehun Chun, Carmen Rodriguez, Michael Schweiger, Albert A. Kruger, Pavel Hrma</i>	
<b>(626a) Redox Properties of Food-Derived Polyphenols .....</b>	541
<i>Minori Uchimiya</i>	
<b>(644a) A Thermodynamic and Process Analysis of the Thermochemical Steps of the Hybrid Photo-Thermal Sulfur-Ammonia Water Splitting Cycle.....</b>	542
<i>Konstantinos E. Kakosimos, Agni Kalyva, Ekaterini Vagia, Athanasios G. Konstandopoulos, Nazim Muradov, Ali T-Raissi, Arun Srinivasa</i>	
<b>(644b) Solar Hydrogen Production Via Copper Oxide – Copper Sulfate Water Splitting Cycle.....</b>	543
<i>Rahul Bhosale, Dareen Dardor, Fares A. AlMomani, Anand Kumar, Moustafa Hussein Ali, Shiva Yousefi, Ahmed AlNouss, Hesam ElFaki</i>	
<b>(644c) Solar-Driven Electrochemical Water-Splitting at Near-Neutral pH Conditions – Operating Strategies and Their Limitations .....</b>	557
<i>Meenesh R. Singh, Chengxiang Xiang, Kimberly Papadantonakis, Nathan S. Lewis</i>	
<b>(644d) High-Purity Hydrogen Production at Lower Temperatures Via Sorption-Enhanced Steam Methane Reforming Using a Novel K-Doped Li<sub>4</sub>SiO<sub>4</sub> with High-Purity CO<sub>2</sub> Generation during Desorption Process .....</b>	558
<i>Qi Zhang, Chen Shen, Sai Zhang, Dong Peng, Zibin Zhu</i>	
<b>(644e) Self-Activation and Improved Stability Investigation of a Novel Plate-Type Al<sub>2</sub>O<sub>3</sub>/Al Monolith Supported Cu-Based Catalyst in Steam Reforming of Dimethyl Ether .....</b>	559
<i>Feiyue Fan, Qi Zhang, Xing Wang, Zibin Zhu</i>	
<b>(644f) Biohydrogen Production Using Gamma Irradiated Sludge as Inoculum.....</b>	560
<i>Yanan Yin</i>	
<b>(672a) Polymer-Nanoparticle Mixed Matrix Membranes for Toxic Metal and Organic Remediation in Water .....</b>	561
<i>Minghui Gui, Douglas Davenport, Andrew Colburn, Noah D. Meeks, Lindell Ormsbee, Dibakar Bhattacharyya</i>	
<b>(672b) Optimization of an Electrochemical Process for Recycling Metals from Electronic Waste .....</b>	562
<i>Luis A. Diaz, Tedd Lister, Gemma Clark</i>	
<b>(672c) Utilization of Alkaline Wastes from Petrochemical Industry for CO<sub>2</sub> Fixation and Supplementary Cementitious Material Production .....</b>	563
<i>Shu-Yuan Pan, Silu Pei, Chen-Hsiang Hung, Yin-Wen Chan, Pen-Chi Chiang</i>	
<b>(672d) Generating Perchlorate and N-Nitrosodimethylamine Isotherms Using Pecan Shell Activated Carbons .....</b>	564
<i>Jere Freeh</i>	
<b>(672e) Extraction and Simulated Moving Bed Methods for Efficient Recovery of High-Purity Polycarbonates and Flame Retardants from Polymer Wastes.....</b>	565
<i>George S. Weeden, Nicholas Soepriatna, Lei Ling, Nien-Hwa, Linda Wang</i>	
<b>(672f) Adsorption of Diclofenac and Carbamazepine from Aqueous Solution on Granular Activated Carbon.....</b>	566
<i>Roberto Leyva-Ramos, Raul Ocampo-Perez, Adriana I. moral-Rodriguez</i>	
<b>(672g) Rapid Toxicity Screening of Gasification Ashes .....</b>	567
<i>Xu Zhen, Le Rong, Wei Cheng Ng, Cynthia Ong, Gyeong Hun Baeg, Wenlin Zhang, Si Ni Lee, Sam Fong Yau Li, Yanjun Dai, Yen Wah Tong, Koon Gee Neoh, Chi-Hwa Wang</i>	
<b>(692a) Vector-Based Sustainability Analysis: A Fundamental Study on Sustainable Development.....</b>	568
<i>Majid Moradi Aliabadi, Yinlun Huang</i>	
<b>(692b) Statistical Algorithm for Sustainability Measurement and Decision Making.....</b>	569
<i>Rajib Mukherjee, Alessandra R. Carreon, Subhas Sikdar</i>	
<b>(692c) Multi-Objective Optimization Combined with Input-Output and Eco-Cost Assessment for Decarbonizing the European Economy.....</b>	570
<i>Daniel Cortés-Borda, Laureano Jiménez, Gonzalo Guillén-Gosálbez</i>	
<b>(692d) Assessing Sustainability By Life Cycle Assessment Versus Techno-Ecological Synergy .....</b>	573
<i>Xinyu Liu, Varsha Gopalakrishnan, Bhavik R. Bakshi, Guy Ziv</i>	
<b>(692e) Life Cycle Analysis of Three Methods to Treat Primary Clarifier Effluent: Aerated Activated Sludge Bed, Hrad Combined to a Trickling Filter and Trickling Filter .....</b>	575
<i>Michael Cooney</i>	
<b>(715a) Controlled Oxidation of Trichloroethylene Using Polymer-Encapsulated Potassium Permanganate in the Presence of Hexavalent Chromium.....</b>	576
<i>Jude Ighere, Daniel Attoh, Ramesh Chawla</i>	
<b>(715b) Optimization of Fenton's Oxidation Conditions for Removal of Chrysene in Aqueous Solutions .....</b>	577
<i>Karyn Moses, Phillip Stringer, Kendra Green, Vanisree Mulabagal, Shamim Begum, Nader Vahdat</i>	

<b>(715d) Effective Photocatalytic Oxidation of Antibiotics in Water: Effects of Carbon Support and Inorganic Anions.....</b>	591
<i>Eunsung Kan, Jihyun R. Kim</i>	
<b>(715e) Environmental Remediation of Dense Non-Aqueous-Phase Liquids Using Iron Loaded Halloysite Nanotubes .....</b>	592
<i>Yang Su</i>	
<b>(715f) Biological Risks from Disinfection By-Products from Chlorination and Chloramination of Water Containing Phthalates Contaminants.....</b>	593
<i>Hyun Kyung Kim</i>	
<b>(752a) Greenscope Tool for Process Sustainability Assessment and Life Cycle Inventory Generation .....</b>	604
<i>Gerardo J. Ruiz-Mercado, Raymond L. Smith, Michael A. Gonzalez, William M. Barrett, Daniel Young</i>	
<b>(752b) LCA Needs to Move Toward Sustainability to Remain Relevant-.....</b>	605
<i>Sergio F. Galeano</i>	
<b>(752c) Sustainability Metrics for Charging Infrastructure for Electric Vehicles.....</b>	606
<i>Jennifer L. Anthony, Larry Erickson, John R. Schlupe</i>	
<b>(752d) Combined Sustainability Assessment and Techno-Economic Analysis for the Production of Biomass-Derived High-Octane Gasoline Blendstock .....</b>	607
<i>Eric C. D. Tan, Michael Talmadge, Abhijit Dutta</i>	
<b>(752e) Assessing the Recovery of N-Methyl-2-Pyrrolidone from Waste Streams in the Specialty Chemical Industry .....</b>	620
<i>C. Stewart Slater, Mariano J. Savelski, Brigitte Pastore, Frank Richetti, Nancy Uff</i>	
<b>(752f) Looking into the Future of the Ethylene Industry: A Generic Assessment Model for Emerging Technologies .....</b>	634
<i>Yuan Yao, Diane J. Graziano, Mathew Riddle, Eric Masanet</i>	
<b>Author Index</b>	