TABLE OF CONTENTS

Volume 1

Dispersion of Contaminants In Urban Areas: Coupling Dispersion and CFD Models ......................................................... 1
José-Francisco Portales, Eva Gallego, Xavier Roca

Atmospheric Dispersion Using Commercially Available CFD Software .................................................................................. 5
Eric Peterson, Morgan Reed, Chaitanya Sheth


Aqueous-Phase Organic-Inorganic Aerosol Chemistry: Model Simulations ..................................................................................... 11
V. Faye McNeill

Exploring Atmospheric Organic Aerosol Source Apportionment In the United States for An Entire Simulation Year ................................................................................................................................................................................................. 12
Benjamin N. Murphy, Kristina M. Wagstrom, Speros N. Pandis

Discrete Phase Modeling of Atmospheric Particulate Transport From Mine Tailings ................................................................. 14
Andrea C. Landázuri, Jacqueline Braunetis, Eduardo Sáez, Eric Betterton

Optimizing Data Assimilation Parameters for Improved CMAQ PM2.5 Estimates Over the United States to Inform Epidemiological Studies ................................................................................................................................................................................................. 15
Gregg T. Beckham, Larry Taylor, Michael F. Crowley, William S. Adney, Michael E. Himmel

A Hybrid Approach for Developing Time-Space Resolved Estimates of Ambient Air Pollution Exposure ................................................................................................................................................................................................. 16
Naresch Kumar

Fermentation Cost Improvement Through Propagation Advances for a Commercially Relevant Biomass-to-Ethanol Process ................................................................................................................................................................................................. 17

Combined Computational and Experimental Investigations of Processive Cellulases for Engineering Activity Improvements ................................................................................................................................................................................................. 18
Josebus M. Van Zyl, Thomas M. Harms, Eugéne Van Rensburg, Willem H. Van Zyl, Lee R. Lynd

Exploration of Significant Enzyme Activities Required for the Deconstruction of Ionic-Liquid Pretreated Biomass ................................................................................................................................................................................................. 19
Christopher J. Barr, Jeffery Mertens, Constance Schall

Inhibition of Enzymatic Hydrolysis by Soluble Sugars on Model Cellulose Thin Film Using Quartz Crystal Microbalance ................................................................................................................................................................................................. 20
Hu-Fen Li, Ravinder Gurolapalli, Michael D. Flynn, Sue E. Nokes, Stephen E. Rankin, Barbara L. Knutson

Selection and Characterization of Acid-Stable Cellulases Against Pretreated Oil Palm Empty Fruit Bunch From a Colombian Extreme Environment ................................................................................................................................................................................................. 22
Luis Miguel Medina, Luisa Cabezas, Isabella Bahamon, Laura Palma, Andrés González, Silvia Riestrepo

Effect of AFEF Pretreatment Degradation Products On Enzymatic Hydrolysis and Microbial Fermentation by Saccharomyces Cerevisiae 424A(LNH-ST) ................................................................................................................................................................................................. 24
Xiaoyu Tang, Leonardo Da Costa Sousa, Shishir Chandawat, Mingjie Jin, Lau Meng, James Humpula, Nirmal Upadhunand, Kevin Channabasav, Keyan Vezin, Daniel Jones, Zeyi Xiao, Bruce Dale, Venkatesh Balan

Modelling Simultaneous Saccharification and Fermentation of Microcrystalline Cellulose Using Computational Fluid Dynamics ................................................................................................................................................................................................. 25
Josébus M. Van Zyl, Thomas M. Harms, Eugene Van Rensburg, Willem H. Van Zyl, Lee R. Lynd

Modelling Acid Gas Reactions In Air Products Sour Compression Process ................................................................................................................................................................................................. 26
Frank Petocelli, Vince White, Jeremy Immer

The Effect of Compression and Intercooling On the Composition of a Pulverized Coal Oxycombustion Flue Gas ................................................................................................................................................................................................. 30
Stephen J. Gerdemann, Casey Carney, John Clark, Sivaram Hariharan, Thomas Ochs, Danilo Orsichley

A Novel High Pressure Oxyfuel Process with Staged Combustion ................................................................................................................................................................................................. 31
Krish R. Krishnamurthy, Hanno Tautz

High Temperature Oxygen Production ................................................................................................................................................................................................. 37
Michael K. Opoku, Jan A. Puszyński

Design, Construction and Operation of a Pilot Scale Integrated Pollutant Removal (IPR) Process for Oxy-Combustion ................................................................................................................................................................................................. 38
Shreyas G. Arvind, Danylo Oryshchyn

From Risk Management to Sustainability: in Theory and in Practice ................................................................................................................................................................................................. 39
Subhas Sidhar

Sustainable Forest Resource Biorefineries – Vision for the Future ................................................................................................................................. 40
Shri Ramaswamy

Sustainable Hydrogen, Gasoline, and Diesel Biofuels From Grasses and Crop Residues ................................................................................................................................................................................................. 41
Rami B. Gupta

Biogenic Organic Aerosol: Aging Under Various Light Conditions and Oxidant Concentrations ................................................................................................................................................................................................. 42
Kaylin M. Henry, Neil M. Donahue

Size Dependent Growth Rates of Freshly Nucleated Particles ................................................................................................................................................................................................. 44
Chongai Kuang, Mod Patel, Peter H. McMurry, Jian Wang
On the Nature of Water-Soluble Organic Aerosols In the Southern California Region ................................................................. 45
Armin Sarooschian, Hauh Duong, Anna Wonacottz, Scott Hersey, Jill Craven, Andrew Meixcalf, Athanassia Nenes, Haji Fida
Jonsson, Richard C. Flagan, John H. Seinfeld

Inferring New Particle Formation and Growth From Measurements of Aerosol Properties ......................................................... 46
Robert Ballard, Charles O. Stanier

Compositional and Mixing State Impacts On Size-Resolved CCN Concentrations In Atlanta, Georgia, During 2008-2009 ................................................................. 47
Richard H. Moore, Luz T. Padro, Molly McLaughlin, Athanassia Nenes

Dynamical Equilibrium States In Low Temperature Cirrus ............................. 49
Athanassia Nenes, Dongjun Barabosa

CCN and Morphology Imaging of Numerous Oxidized VOCs In a Smog Chamber ................................................................. 50
William L. Maudry, Darbiya Dachter, Timothy Raymond

Investigation of Hygroscopic and Morphological Properties of Atmospheric Aerosols ......................................................... 51
Laura Cook, Timothy Raymond

Climate Change and Greenhouse Gas Emissions: Current Law, Voluntary Initiatives and Future Implications ............................ 52

Total Global Warming Potential: An Expanded Definition of GWP ......................................................................................... 53
Paul Blowers, Christina Canter, Daniel David Galvan

Regional Carbon Footprint of Dairy Feed Rations for Milk Production In the United States ................................................................. 55
Felix Adam, Ashley Maes, Charles Workman, Zara Clayton-Nierderman, Greg Thoma, David Shonnard

An Energetic Comparison Between Heat Integrated Pressure-Temperature-Swing Adsorption Using Alkaline-Earth Oxide Sorbents and Amines for the Capture of CO2 From Coal Fired Plants ................................................................................. 56
Paul Ghugasian

Overview and Perspectives of CO2 Emission In Chinese Cement Industry ........................................................................... 57
De-Long Xu, Hui Li, Jian Zhang, Yongxiang Ren, Yong-Hua Duan, Yong Min

Control of Hg Emissions From Coal-Fired Power Plants In China ......................................................................................... 58
Fan Zhang, Shuang Deng, Yu Liu, Hongmei Wang, Zi Liu

Sustainability of Biomass Crop Production ................................................................. 59
Shijie Liu

Determining and Addressing Feedstock Variability for Thermochemical Biomass Conversion ................................................. 60
Jessica L. Olstad, Kim Magrini, Richard Boardman, Garold L. Gresham

Variability of Switchgrass, a Dedicated Bioenergy Crop ........................................................................................................... 61
Paul B. Filson, Nicole Labbe, Samuel W. Jackson, Elena Doukhanina, Parhiphan Radhakrishnan, Joon-Hyun Park

Anaerobic Bacterial Treatment of Corn Stover to Prepare a Biorefining Feedstock ................................................................. 62
James Maclellan

Pellets From Pretreated Biomass ................................................................................. 64
M. Toufiq Reza, Charles J. Coronella, Joan G. Lynam, Victor R. Vasquez

Change of the Structure of Sweet Sorghum Bagasse After Solid-Fermentation ........................................................................ 65
Jihong Li, Shizhong Li, Zhipei Yan, Qing Li, Liangcai Peng

Sustainable Business Operation and Environmental Preservation - The Evolving 21st Century Thinking On the Achievability of Both ................................................................................. 66
Jacqueline Sibbles

Preparing Students for Careers In Which Sustainability Will Grow In Importance ............................................................................ 68
Larry Erickson, Keith L. Holm, John R. Schluip

Sustainability Education In Progress At New York Institute of Technology .................................................................................. 69
Nada Marie Anid

Teaching the Concepts of Life Cycle Assessment Through the Evaluation of Pharmaceutical Syntheses ............................................. 69
Marignio J. Savelski, C. Stewart Slater, David Hitchcock

Sustainability Initiatives At Several U.S. Institutions of Higher Education .................................................................................. 70
M. P. Sharma, Matthew Winslett, Robert W. Peters

Teaching Life Cycle Assessment and Related Concepts ................................................................. 83
Arunprakash T. Karunamithi

Global Climate Change-the Sustainability Challenge ................................................................................................. 84
Frank Principiota

Converting Carbon Dioxide and Water Into Hydrocarbons with Solar Energy and Nanostructured Metal Surfaces ................................................................................. 85
Mengyan Shen, Cong Wang, Haihun Hua, Haizhou Ren, Michael Johnson

Electrochemical Conversion of CO2 with Ionic Liquids In a Microfluidic Reactor ................................................................................. 86
Armin Sarooschian, Hauh Duong, Anna Wonacottz, Scott Hersey, Jill Craven, Andrew Meixcalf, Athanassia Nenes, Haji Fida
Jonsson, Richard C. Flagan, John H. Seinfeld

Status and Challenges to Implement Large-Scale Energy Storage Into the Grid ........................................................................... 88
John Lemmon

Investigations On Geothermal Heat Pump Systems Using Treated Waste Water As Energy Source ................................................. 89
Huajun Yuan, Maghana Cherukuri, Sohail Murad

Optimizing Energy Consumption In Gas Oil Separation Plant Using Lean Six Sigma Methodology ...................................................... 90
Bandar Jahrun Aliqahmat, Mahmood Baby-Noor Eldin

A Global Challenge to Adsorption Processes In Public Water Supply Production: Mechanisms, Effects, Design Considerations, and Strategic Aversion ................................................................................. 91
Walter J. Weber Jr.

Water Challenges and Opportunities In the Emerging World ................................................................................................. 120
Adil Dhalla
Sea Using An Optimisation Framework to BESs
High Photon Flux Photoelectrochemical Reactor: Modelling and Operation
Energy Balances for the Production of Cellulosic Ethanol
Development of An Integrated CO2 Capture, Transportation and Storage Infrastructure for the UK and North Nationwide Energy Supply Chain Analysis for Transportation Fuels
The Importance of Pt Dispersion In DeNOx Catalysts
Simultaneous Reduction of NOx, Solid, and Semi-Volatile Particles Using 4-Way Catalyzed Filtration Systems
Online Measurements of Structure and Mass Concentration for Airborne Nanoparticle Agglomerates
Optimization of Laminar Flow Ultrafine Condensation Particle Counters for the Enhanced Detection of 1 Nanometer Condensation Nuclei
Online Measurements of Structure and Mass Concentration for Airborne Nanoparticle Agglomerates
Simultaneous Reduction of NOx, Solid, and Semi-Volatile Particles Using 4-Way Catalyzed Filtration Systems
The Importance of Pt Dispersion In DeNOx Catalysts
Towards Sustainable Manufacturing: An Approach Evaluating Energy Reduction Techniques for System Improvement
Optimization of Fuel Gas Networks for Energy Sustainability
Nationwide Energy Supply Chain Analysis for Transportation Fuels
Development of An Integrated CO2 Capture, Transportation and Storage Infrastructure for the UK and North Seas
Sea Using An Optimisation Framework
Energy Balances for the Production of Cellulosic Ethanol
High Photon Flux Photocatalytic Reactor: Modelling and Operation
The Kinetics of Redox Reactions of Hexavalent Chromium and Trichloroethylene In Wastes Containing Both Contaminants
Kinetic Modeling of Gas-Phase Mercury Oxidation by Chlorine and Bromine In Combustion Effluents During Oxy-Combustion
A Computational Model to Evaluate Solar Offset and Water Generation From Atmospheric Moisture Using Location-Specific Annual Climate Data

Dina Milani, Ali Abbas, Matteo Chiessa

Toxicity of Fluor Gas In Microalgae CO2 Mitigation Systems

Adriana Pacheco, Mario M. Alvarez, Javier LaraGil

Reducing Air Quality Impact From Plant Start-up Emissions by Integrating Air Quality Modeling and Plant Start-up Simulation

Jian Zhang, Qiang Xu, Thomas C. Ho

Modeling and Optimization of a Modified Claus Process As Part of An Integrated Gasification Combined Cycle (IGCC) Plant with CO2 Capture

Debangsu Bhattacharyya, Dustin D. Jones, Richard Turton, Stephen E. Zitney

Modeling a Net Zero Future with Historic Buildings

Philip Saieg

Flame Retardant Siloxane Polymers Produced by Eco-Friendly Synthetic Methods

Romy Kirby, Ravi Montrukal, Jason W. Sorensen

The Healthy Energy and Envelope Balance

Margaret Paule, Philip Saieg

Detera® Biobased Polymer and It's Use In Durable Applications

Jeffrey J. Cernohous, Brandon J. Cernohous, Adam R. Pawlowski

Roofing Materials As Effective Means to Decrease Heat Loads On Buildings

Robert W. Peters, Sandra Nunez, Ronald Sherrill, Matthew Winkleet

Comparison of Miscibility Between Paraffin and Three Types of Polyethylene in Polyethylene/Paraffin Blends as Form-stable Phase Change Materials

Fang Chen, Michael Wollcot

Recent Advances In Selected Types of Sustainable Building Materials

Tom R. Marrero

Removal of Cr(VI) In Aqueous Solution by Fe3O4 Nanoparticles In the Presence and Absence of Mn(II)

Yong Liu, Shuyi Jia, Songhai Wu, Yongli Sun

Effect of Airborne Deposition On Water Acidity In the Rio Grande River Basin

Qing Qian, Badri Parajuli, Luke Prinsloo, Jerry Lin, Jack Hopper, T. C. Ho

Removal of Boron From Waste Water by Electro-Coagulation Process

Krishan K. Garg Jr., B. Prasad Sr.

Effect of Makeup Water Properties On the Condenser Fouling In Power Plant Cooling System

Iman Safari, Michael E. Walker, Jawad Abbasian, Hamid Arastoopour, Ming-Kai Hsieh, David A. Dzombak, David C. Miller

Complete Mineralization of Sulphonated Azo Dyes Using Bacterial Consortia

Arin Tiwari, Sanjeev Garg

Field Sampling of Water/Sediments for Atrazine and Amoxicillin Contaminations In the Rio Grande Basin

Manohar Palla, Daniel H. Chen, Jewel Andrew Gomes, Kevin Urbanczyk, Guy Falzarano

Aerobic SBR Processes In Treating PTA Manufacturing Wastewater

Zheng Yannei, Yufeng Han, Jiale Huang, Qinghao Li

Gasification of Orange Residue Chars In CO2

Astrid Altamar, Siuen Amorim, Valqueria Balvedi, Regina F. P. M. Moreira, Humberto J. José

A Numerical Study On Bio-Oil Gasification Using A Multicomponent Approach

Lei Zhang, Song-Chaung Kong

Realistic Impurity Generation Via Coal Gasification

Robert R. Mott

Comparison of 1D Modeling Methods for Entrained Coal Gasification

Moon-Kyeong Hwang

Rigorous Modeling of An Entrained Flow Gasifier Considering a Heuristic Recirculation Model and a Detailed Energy Balance

Job Kasule, Richard Turton, Debangsu Bhattacharyya, Stephen E. Zitney

Process Design and Validation of Operation In a Coal-to-Methanol Gasification Plant Using Probabilistic Methodologies

Raul E. Ayala, Judith B. Corry

A New Process for Improved Dust Removal by Cyclone

Sanaz Akhbari Far, Sorosol Zahedi, Mansoor Shirvan, Sepideh Akhbarifar

Metal Nanoparticle Synthesis In Aerosol Reactors

Jun Liu, Sean C. Garrick

Plasma-Assisted Aerosol Synthesis of Silicon Nanocrystals for Solar Cells

Dao Milani, Ali Abbas, Matteo Chiessa

Fundamental Design of Microfibrous Materials As Pleated Filter Media

Yanli Chen, Guomin Xu, Bruce J. Tartachuk

Synthesis of TiO2 Nanoparticles Modified by Transition Metals For Solar Fuel Production From CO2 and Water

Ying Li, Fei Gao

Low Temperature Synthesis of N-TiO2 Particles by Hydrazine-Assisted Aerosol Pyrolysis of Titanium Tetraisopropoxide Nitric Solution

David J. Rowe, Uwe R. Kortshagen

Modeling Air-Borne Nanoparticle Diffusion Through Filters

Tsz Yan Ling, Jing Wang, David Y. H. Pui
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient Luminescence From Silicon Nanocrystals: Role of the Plasma Afterglow</td>
<td>252</td>
</tr>
<tr>
<td>Competing Forces On the Extraction of Heavy Metals In Soil Remediation</td>
<td>254</td>
</tr>
<tr>
<td>Behavior of Mercury During Chemical Processing In the Defense Waste Processing Facility</td>
<td>255</td>
</tr>
<tr>
<td>Attenuation of Tetrachloroethylene In Groundwater by Bioremediation</td>
<td>256</td>
</tr>
<tr>
<td>Isolation and Characterization of a TNT-Degrading Bacterium</td>
<td>257</td>
</tr>
<tr>
<td>Chemical Release During Dredging of Contaminated Sediment</td>
<td>258</td>
</tr>
<tr>
<td>BP Oil Ganglia Transport In Transparent Porous Media At Low Capillary Number</td>
<td>260</td>
</tr>
<tr>
<td>Assessment of Potential Exposure to Carbon Nanotubes In the Production of Polymer Nanocomposites</td>
<td>261</td>
</tr>
<tr>
<td>A Novel Technique for In-Vivo Toxicological Characterization of Engineered Nanomaterials</td>
<td>262</td>
</tr>
<tr>
<td>Evaluation of the Toxicity of Nanomaterials Based On Knowledge Extraction From High Throughput Screening of Biological Toxicity Data</td>
<td>263</td>
</tr>
<tr>
<td>Human Blood Biocompatibility of Silver Nanoparticles</td>
<td>264</td>
</tr>
<tr>
<td>Nanotechnology – What's So Big about the Small Stuff?</td>
<td>265</td>
</tr>
<tr>
<td>Forensic Analysis of Nano-Material Environmental Regulation</td>
<td>266</td>
</tr>
<tr>
<td>Solar Thermal Production of Hydrogen Using Alumina Supported Ferrites: Thermodynamic Evaluation and On-Sun Validation</td>
<td>268</td>
</tr>
<tr>
<td>Comparison of On-Board Hydrogen Production From Several Non-Fossil Fuel Feedstocks</td>
<td>269</td>
</tr>
<tr>
<td>Energy Optimization of Hydrogen Production From Biomass</td>
<td>270</td>
</tr>
<tr>
<td>Steam Reforming of Ethanol-Phenol Mixture As a Model for Biomass Tar</td>
<td>271</td>
</tr>
<tr>
<td>Synthesis of Ru Nanoparticles Supported Over Carbon Film by Pulsed Laser Deposition for Hydrogen Production by Catalytic Hydrolysis of NaBH4</td>
<td>272</td>
</tr>
<tr>
<td>Hydrogen Release During Experimental Solid Sodium Borohydride Tablet Hydrolysis Reactions</td>
<td>273</td>
</tr>
<tr>
<td>Enhanced Food Waste Hydrolysis for Integrated Biofuel Production</td>
<td>274</td>
</tr>
<tr>
<td>Biodiesel Production by Utilizing by Products From Fish Oil Concentration</td>
<td>275</td>
</tr>
<tr>
<td>A Sustainable Energy Campus</td>
<td>276</td>
</tr>
<tr>
<td>Air Quality Impacts of Achieving U.S. Renewable Fuel Mandates</td>
<td>277</td>
</tr>
<tr>
<td>Multi-Objective Footprints-Based Synthesis of Integrated Bioethanol Production Systems</td>
<td>278</td>
</tr>
<tr>
<td>Dilute Acid Pretreatment of Farm-Waste Cultured Algae and Its Effect On Enzymatic Hydrolysis of Cellulose</td>
<td>279</td>
</tr>
<tr>
<td>High Quality Biodiesel Fuel Production From Crude Jatropha Oil without Upstream and Downstream Processing</td>
<td>280</td>
</tr>
<tr>
<td>Pyrolysis Vs. Gasification: Effect of Oxygen In Reaction Atmosphere On Biochar Properties</td>
<td>281</td>
</tr>
<tr>
<td>Pretreatment of Loblolly Pine for Fast Pyrolysis Via Torrefaction</td>
<td>282</td>
</tr>
<tr>
<td>Characterization of Biochar, the by-Product of Energy Production From Biomass Via Thermochemical Processes</td>
<td>283</td>
</tr>
<tr>
<td>Pyrolysis of Cellulose with the Use of Ionic Liquid for Efficient Production of Levogluconesone</td>
<td>284</td>
</tr>
<tr>
<td>Modeling of the Formation and Reaction Properties of Biomass</td>
<td>285</td>
</tr>
<tr>
<td>Effect of Pressure and Heating Rate On Biomass Devolutilization and Gasification</td>
<td>286</td>
</tr>
<tr>
<td>Technoeconomic Analysis of Biomass Gasification System Utilizing Geothermal Energy for Processing</td>
<td>287</td>
</tr>
</tbody>
</table>
Feasibility Study of High Cut Rate of Dissolved Mineral Salts In Electrodialysis Reversal Process
Ali Sharbat, Neil E. Moe, John Barber, Abbas Ghassemi
363

Green Engineering and Sustainability: A Systems Analysis Perspective
Urmila Divekar
367

WISE Presentation: Addressing Regulatory Barriers to Grid-Scale Energy Storage Deployment
Mikkal Vendevergh
368

WISE Presentation: Creating a Federal Mandate for State Renewable Electricity Standards (RES)
369

Effect of Biomass Feedstock On the Sustainability Metrics of Fischer-Tropsch Fuels
Ignavi Palou-Rivera, M. Q. Wang
379

An Integrated Framework for Design of Sustainable Chemical Process Based On Life Cycle Assessment
Kris B. Heruo, Yasunori Kitachi
380

Application of Ultrasound with Various Pretreatments to Improve Biological Hydrogen Production From Food Waste
Ensayed Elberbitheby, Bipro Banjan Dhar, Hisham Hafez, George Nakhlia
381

Hydrogen Production Via Fermentation of Avicel and Corn Stover In a Sequencing Batch Reactor
Lauren R. Magnuson, Mohaghegh Ali, Thammananwongsoa Shivegovida, Melvin Tucker, Maness Pin-Ching
382

Biological Hydrogen Production From Municipal Solid Waste
Savarna Talaturi, Mohan Raj Subramanian, Lew P. Christopher
383

Optimization of Photosynthetic Hydrogen Yield From Platinized Photosystem I Complexes
Rosemary K. Le, Ifeyinwa J. Iwuchukwu, Ernest A. Iwuchukwu, Barry D. Bruce, Rupyi S. Sawhney, Paul D. Frymier
384

Synthesis of Bifunctional Catalyst for Aqueous Phase Reforming of Biomass
Rica Tungal, Rajesh Shende, Carlos Landaverde Alvarado, Kenneth M. Benjamin
385

Catalytic Hydrolysis of Ammonia Borane Using Co-B Nanoparticles Embedded In Mesoporous Silica Particles: A Very Efficient Catalyst for Hydrogen Production
Justin T. Kalfenberger, Haujinguang Huang, Ulrike Tschirner, Ben Schroeder, Walced Al-Dajani, Shri Ramaswamy
386

Comparing Resource Consumption and Sustainability of Biobased Materials Using Eco-LCA
Erin F. Landers, Bhabik R. Bakshi
387

Sustainable Green Composites
Amar K. Mohanty, Manju Misra
N/A

Integrated Biorefinery Operations: Biomass Pretreatment As It Relates to Biochemical and Thermochemical Products
Brian L. Cooper, Jeff London, Robert Mellow
389

Green Poly (lactic acid) Composites Reinforced with Sugarcane Bagasse Residues
Letian Wang, Zhaohui Tong
390

Alternative Uses of Sugarcane Molasses and Jaggery for Production of Value Added Fatty Acids, Especially Oxalic Acid
A. K. Ray, Sweeta Gupta, Pradosh Sanyal, Sujay Chattopadhyay
391

Modeling the Hydrolytic Degradation and Distribution of Polymer Species In Biopolymers
Wendy Guo, Xiaoao Bi, Jim C. Lim, Shahab Sohansanj
410

Experimental Study On Bst Fiber Reinforced Soy-Based Polyurethane
Shanshan Huo, Chad A. Ulven
412

Plant Seed Oils and It's Derivatives Based Value-Added Products From Central India Region of the India
Bhalchandra Vihute, Anand S. Kulkarni
N/A

Improving the Sustainability of Biofuels Through Modification of the Biomass Production Subsystem: Application to Corn and Lignocellulosic Ethanol
Robert A. Urban, Bhavik R. Bakshi
413

Agent-Based Modeling Analysis of Biomass Feedstock Production System Dynamics and Resilience
Yogendra Shastri, Luis Rodriguez, Alan Hansen, K. C. Ting
415

Effect of Storage Method and Duration On the Bioprocessing of Lignocellulosic Biomass
Arun Athmanathan, Nathan S. Mosier
417

Determination of Kinetic Parameters of Self-ignition Wood Pellets During Storage
Wendi Guo, Xiaoao Bi, Jim C. Lim, Shahab Sohansanj
418

Coupled Optimization and Simulation for Multi-Biomass Source-to-Biorefinery Supply Chain Modeling and Analysis
William Faulkner, Joseph Amundson, Fazleena Badurdeen, Jeffrey Seay
425

Improving the Quality of Spent Mushroom Substrate (SMS) As Feedstock for Biorefineries
Maria Nydia Ruiz-Felix, Justin M. Yeast, Justinus A. Satrio
426
Sustainability Evaluation of LNG Processing Technologies ................................................................. 428
Modeling and Optimization of Natural Gas Liquefaction Process for Reducing Energy Consumption ................................................................. 429
Jeongwoo Jeon, Kiwook Song, Chul-Jin Lee, Youngsub Lim, Chonghun Han
Ethylene Oxide Production without CO2 As Byproduct: Is the Homogeneous H2O2-Based Catalytic Process Practically Viable? ................................................................. 430
Madhav Ghanta, Hyun Jin Lee, Darryl Busch, Darryl Fahey, Balaji Subramamiam
Use of Lifecycle Tools to Optimize Sustainable Energy Campuses ................................................................. 431
Ezra R. Beaver
Cost Minimization Model for Heat Recovery for Hydrogen Production From Biomass Steam Gasification ................................................................. 432
Abhar Inayat, Murni M. Ahmad, Mohamed I. A. Mustahib, Suzana Yusup
Completing the Cycle: Capturing Gaseous Waste Carbon As Fuel/Chemicals ................................................................. 433
Michael A. Schulz, Derek W. Griffin
Impact of Lignin Extraction and Cellulose III Conversion On the Enzymatic Digestibility of Corn Stover ................................................................. 434
Leonardo Da Costa Sousa, Shihir Chandawat, Nirmal Uppugundula, Bruce Dale, Venkatesh Balam
The Effects of Cationic Polyelectrolyte On the Pretreatment and Enzymatic Hydrolysis of Corn Stover ................................................................. 435
Shaowen Ji, Ilsoon Lee
Novel Lignocellulosic Biomass Pretreatment Using a Modified Taylor-Couette Mixer for Biofuels and Biomaterials ................................................................. 436
Wei Wang, Ilsoon Lee
Modeling and Scale up of CO2-Water Pretreatment of Guayule Biomass ................................................................. 437
Ehsan Moharrerji, J. Richard Elliott
Effect of Transition Metal Catalyst On Lignin Oxidation During Alkaline Hydrogen Peroxide Pretreatment ................................................................. 438
Zhangjun Li, David Hodge
Progress Toward Biological Pretreatment - Understanding Plant Cell Wall Degradation by Termite and White-Rot Fungi ................................................................. 439
Shulin Chen, Jing Ke, Dhruvagoyti D. Lakkar, Ji-jiao Zeng
The Investigation of Aluminum Wastes Encapsulated In the Individual Phases of Ordinary Portland Cement ................................................................. 440
Tobias P. Neville, S. R. J. Simons, P. Lettieri
Leaching Behavior of Hazardous Heavy Metals From Lime Fly Ash Cements ................................................................. 447
Ojas Chaudhari, Joseph Biernacki
Comparative Study of Performance of Different Chelating Agents for Extraction of Ni From Spent Catalyst ................................................................. 448
Garima Chaudhan, K. K. Pant, K. D. P. Nigam
Modeling Aggregation and Size Distribution of Nanoparticles In Aqueous Suspensions ................................................................. 458
Haoyang H. Liu, Sirkarn Surawansiy, G. Orkoudas, Yoram Cohen
Stability of Engineered Nanoparticles In Aqueous Systems: Elucidating the Roles of Capping Agents and Natural Organic Matter ................................................................. 459
Jeffrey A. Nason
Removal of Nanoparticles In Semiconductor Manufacturing Effluents Using Porous Media Filtration ................................................................. 460
Jeff Rottman, Rayes Sierra, Farhang Shadman
Adsorption of Gold Nanoparticles and Humic Acid On Activated Carbon Used In Drinking Water Treatment ................................................................. 461
Holly A. Streit, Vasanta Palle, Martha J. M. Wells
High Throughput Collection and Detection of Environmental Nanoparticles ................................................................. 462
Fanxu Meng, Serdar Oztekr, Maria D. King, Tassir A. Hassan, Victor M. Ugaz
Integrating Nanocellulose Production with Biofuel ........................................................................ 463
Jinyong Zhu
Surface and Aging Characteristics of Paper Coated with Nano Size Zinc Oxide Pigment ........................................................................ 464
Sanjay Tyagi, Remu Tyagi, B. P. Thapliyal, R. M. Mathur, A. K. Ray
Investigation of Mass Transport Properties of Microfibrillated Cellulose (MFC) Films ........................................................................ 479
Matteo Minelli, Marco Giacinti Baschetti, Ferruccio Doghieri, Mikael Ankerfors, Tom Lindaström, David Plackett, István Siró
Co-Products of Bioenergy System: Characterization of Saccharification Residuals ........................................................................ 482
Han-Seung Yang, Shona Duncan, William T. Y. Tze, Jonathan Schilling
Bio-Nano Reinforcement of Polylactic Acid With Surface Modified Cellulose Nanocrystals ........................................................................ 483
José Luis Orellana, Esteban E. Ureña-Benavides, Christopher L. Kitchen
Treatment of Ammonium Wastewater Using Ultrasound-Fenton Process ........................................................................ 484
Yangang Li, Wenpin Hsieh, Rosshvan Mahmudov, C. P. Huang
COD Reduction From Leachate with An Advanced Oxidation Process (AOP) ........................................................................ 500
Kashinath Banerjee, Tapas Das
Photocatalytic Decomposition of Geosmin and 2-Methylisoborneol by M-InVO4/TiO2 With Visible Light In Recirculating Aquaculture Systems ........................................................................ 501
Sandra L. Petit, Louis J. Bajo, John T. Walden
Advanced Oxidation for Water Processing In Microstructured Reactors ........................................................................ 502
Kevin Cuple, Nick Kusanto, Kenneth Williamson, Jeffrey A. Nason, Goran N. Jovanovic, Alexandre F. T. Yokochi
Kinetics of Oxidation of Dyes In Effluents Using a Porous Electrode Ozonator ........................................................................ 503
Alexander P. Mathews, Kishora K. Panda
Adsorptive-Reactive Nanoparticulate Systems for the In Situ Remediation of Chlorinated Hydrocarbons ........................................................................ 513
Bhaskar Shankar, Jingjing Wang, Sijing Zhang, Yingqiong Wang, Vijay T. John, Jihan He, Gary McPherson
Considering Probability In Process Optimization Using Bayesian Network Approach: MTBE Production Case Study ........................................................................ 514
Anahita Sadeghian, Farhang Jalali Farahani
A Novel Recuperative Configuration for Enhancement of Ethylene Oxide Production Via Integration of Ethylene Oxidation Process and Cyclohexane Dehydrogenation

Mohammad Reza Rahimpour, Mohammadreza Gholipour, Marzieh Shokrollahiyanchezeshmah, Majid Raofe Dehnari, Davood Iranshahi, Shahab Amirabadi

Simulation and Multiobjective Optimization of a Continuous Biochemical Reactor Using Multilayer Modeling

Ghanim M. Alivan, Muthanna H. Al-dahhan

Hydrodynamics and Optimization Studies in an Inverse Fluidized BED Bioreactor for Tannery Wastewater Treatment

........................................................................................................................................................................................................555

Superhydrophobic Surfaces Produced by Supercritical Fluid Technology

Charlotte Turner, Oskar Werner, Lars Wügberg

Jet Fuel From Air, Water, and Uranium

Charles W. Forberg, John M. Galle-Bishop

Energy Production From Municipal Waste Plastics Using Thermal Degradaion

.......................................................................................................................................................................................................625

Volatile Sulfur Compounds Removal In Biogas Using Thermo-Oxidative Pretreatment

.................................................................................................................................................................................................611

Multidisciplinary Approach In Developing Region Specific Models for Sustainable Biorefining

.......................................................................................................................................................................................................619

Environmental Releases In the Fuel Ethanol Industry

.......................................................................................................................................................................................................623

Membrane Separation of Ethanol From Bio-Ethanol Containing Gasoline

.......................................................................................................................................................................................................627

Life Cycle Analysis of Geothermal Energy Extraction

Víctor R. Vasquez, O. Hanbury

Degradation by Pulse Corona Discharges: Study on the Possible Chemical Degradation Pathway for Diclofenac

.......................................................................................................................................................................................................631

Impact of Ultrasonicondon on Degradation of Estrone in Pure Water and Waste Activated Sludge

.......................................................................................................................................................................................................635

Advanced Oxidation Processes with DC-Corona Discharge

Muhammed Saleen Tahir, Mahmood Saleem, Matthäus Siebenhofer

Electrochemical Oxidation of Landfill Leachate; Performance of Boron-Doped Diamond Anodes

.......................................................................................................................................................................................................643

Phosphate Removal In Wastewater by Functionalized Mesoporous SBA-15

.......................................................................................................................................................................................................647

Removal of Selenite with Microbial Fuel Cells Utilizing Shewanella Oneidensis MR-1

.......................................................................................................................................................................................................651

Reaction Mechanism of Catalytic Oxidative Depolymerization of Cellulosic Biomass

Hongfei Lin

Infrared Spectroscopy and Thermo Gravimetric Analysis for Cellulose and Residue by Hydrothermal Decomposition

.......................................................................................................................................................................................................655

Landfill Gas Utilization In Gas Turbines: Experimental Results for Combustion of Landfill Impurities In Premixed Flames

.......................................................................................................................................................................................................659

New Modeling Framework of Enzymatic Hydrolysis of Cellulose

.......................................................................................................................................................................................................663

Theoretical Analysis of Biodiesel Production Under High Temperature and Pressure Conditions

.......................................................................................................................................................................................................667

New Design for Advanced Zero Emission Power Plant Concept

.......................................................................................................................................................................................................671

Tunable Reversible Ionic Liquids for CO2 Capture

.......................................................................................................................................................................................................675

Membrane Carbon Capture and the Critical Role of Process System Engineering

.......................................................................................................................................................................................................679

A-Priori Estimation of Reactive Amino Acid Based Ionic Liquids for CO2 Absorption

.......................................................................................................................................................................................................683

Nanomaterials: The Latest Emerging Environmental Contaminant Identification and Measurement

Katrina Varner

Enabling In Situ Real-Time Characterization of Interfaces with Quartz Crystal Microbalance with Dissipation Monitoring

.......................................................................................................................................................................................................687

Mobility and Deposition of Silver Nanoparticles On Silica Surfaces Under Environmentally Relevant Conditions

.......................................................................................................................................................................................................691

Volume 2
Effect of the Aggregation of TiO2 Nanoparticles On Their Fate and Transport In Natural Waters ................................................................. 627
A. K. Ray, Sanjay Tyagi, Narayan C. Mishra

Application of Screening-Level Life-Cycle Assessment to Emerging Nanoproducts: Nanosilver Textiles and CNT Electronics ......................................................................................................................................................... 629
David E. Meyer, Venkata K. K. Upadhyayula

ISEE: A Computational Tool for Industrial Sustainability Assessment and Decision Making ............................................................................. 630
Zheng Liu, Yinhun Huang

Engineering Involvement In Green School Development .......................................................................................................................... 631
Cory D. Jensen

Towards Improved C and N Footprints and Understanding Their Nexus ........................................................................................................ 632
Shweta Singh, Bhavik R. Bakshi

Life Cycle Assessment of Waste-to-Energy Technologies .......................................................................................................................... 633
Zac Coventry, Arunprakash T. Karumanthi

Review of Life-Cycle and Techno-Economic Analyses for Algae Systems: Bottlenecks to Sustainability ......................................................... 635
Melissa Rickman, John Pellegrino, Stephanie Shaw

Assessment Processes for Sustainability and Sustainable Processes ............................................................................................................ 636
Larry Erickson, Ryan Green, Blake Leven, Oval Saulsers, Terrie Boguski

Heterogeneity Analysis of the Dry FGD Process At Medium Temperature In CFB Reactor Based On Eulerian Simulation ........................................ 637
Fei Li

Dry-Type off-Gas Treatment Technology of Exhaust Gases From the Semiconductor Industry for Fluorine Recycling .................................................................................................................................................. 638
Shanxi Yan, Synguey Yamagi, Tadashiro Shijo, Goshi Ichino, Koichi Koike, Akihiro Takeuchi, Yoshio Iwasa

Characterization of Cupric Chloride-Impregnated Sorbents for Elemental Mercury Capture From Coal Combustion Flue Gas ........................................................................................................................................ 639
Xin Li, Joo-Youp Lee

Organic Sulfur Removal From Refinery Fuel Gas ..................................................................................................................................................... 640
Vasili Papavassiliou, Raymond Ormech, Ramchandra Watwe, John Scalone

New Method for the Production of BTX Standard Gas Sampling with SPME As an Alternative to Air Monitoring, Advantages and Limitations ............................................................................................................. 641
Bruno C. Queiroz, Edmilson Pinto Da Silva, Maria Veronica Cerrutti, Paulo F. Moreira Junior, Reinaldo Giudics, Orlando Chiavone Filho, Maria Anita Mendes

Modeling of Long-Time Flux Decay In Cross-Flow Filtration .......................................................................................................................... 643
Philip P. Schonevill, Richard C. Daniel, Rick W. Shimskey, Justin M. Billing, Reid A. Peterson

Control of Packed-Particle Flow Resistances During Cross-Flow Filtration In Microchannels ........................................................................ 646
Nopporn Weeranoppanant, Levy Amar, Michael Hill, Edward F. Leonard

Cross-Flow Filtration of Plasma From Blood From a Microchannel ...................................................................................................................... 648
Xiangnan Ye, Levy Amar, Michael Hill, James Jones, Jacob Baggerman, Cees van Rijin, Edward F. Leonard

An Electrokinetic Model for Combined Fouling During Cross Flow Filtration Of Electrolyte Solution and Charged Colloids .............................................................................................................................. 650
Md Abdalzahra Al Mamun, Reeshav Chatterjee, Sirshendu De, Sabir Bhattacharjee

Comparison of Membrane Performance: Analysis with Fouling Models .................................................................................................... 651
Mingsan Zhou, James E. Kilduff, Georges Beaufort

Glycome Profiling Using Glycan-Directed Monoclonal Antibodies: Applications to Plant Cell Wall/Biomass Characterization .................................................................................................................................................. 654

Progress In Biomass Trait Screening Using a High Throughput Digestibility Platform ................................................................................................. 656
Nick Santoro, Shane Cantu, Jonathan Walton

Rheological Properties of Biomass Deconstruction Process Using Ionic Liquid ........................................................................................................ 660
Alejandro G. Cruz, Jeff Mentel, Seema Singh, Blake Simmons

Molecular Simulation of Lignocellulosic Biomass Components ....................................................................................................................... 661
Loukas Petridis

Microfluidic Assays for Biofuels Research ......................................................................................................................................................... 666
Rajiv Bharadwaj, Aarthi Chandrasekaran, Chieh Chang, April Wong, Blake Simmons, Paul D. Adams, Anup Singh

The Binding Properties of Cellulases On Allomorphs Cellulose and Pretreated Biomass During Enzymatic Hydrolysis ........................................................................................................................................ 669
Dahai Gao, Shishir Chandrakar, Venkatesh Balan, Bruce Dale

Effectiveness of Activated Carbon Adsorption for the Removal of Endocrine Disrupting Chemicals In Drinking Water .................................................................................................................................................. 673
Varadarajan Ravindran, Massoud Pirbazari

Fluorescence Spectroscopy As a Tool for the Characterization of Natural Organic Matter and the Control and Optimization of Drinking Water Treatment Processes ........................................................................................................... 674
Nancy P. Sanchez, Christopher M. Miller

Decontamination of Arsenite Polluted Water by a Zirconium Oxide Based Sorbent ........................................................................................................ 675
Yuming Zheng, Dan Wu, Ling Yu, J. Paul Chen

Bio-refinery Based on Indian Paper Industry Wastes ........................................................................................................................................... 676
A. K. Ray, Sanjay Tyagi, Narayan C. Mishra
Economics of Pretreatment for Biological Processing ..................................................................................................................780
Integrated Biogeochemical Modeling for Sustained Uranium Removal ..........................................................................................781
Jiao Zhao, Radhakrishna Mahadevan

The Role of Geobacterial Cytochromes In Uranium Reduction .....................................................................................................785
Bhushan P. A. Avate, Gemma Reguera, R. Mark Worden

Evaluation of Non-Growth Biokinetic Models for Chromate Reduction with Shewanellae ..........................................................786
Levis Hsu, Kenneth H. Neulson, Massoud Pirbazari

Biotransformation of Coffee Pulp/Husk by Lignicolous Filamentous Fungi ..................................................................................787
Maria Del Pilar Sierra-Gámbe, Patricia Ortiz-Bermédez

Detecting Biological Networks In Clostridium Thermocellum Using Computational Approaches ..................................................789
Wen Zhou, Vinay Patil

Investigating the Mechanisms of Arsenic Removal by Microbial Layer In a Bio-Sand Filter ...............................................................790
Hannah Gray, Charlotte Oan, Varadarajan Ravindran, Levis Hsu, Massoud Pirbazari

Ultra-Rapid Elimination of Biofilms On Metal and Ceramic Surfaces Via the Combustion of a Nanoenergetic Coating ..........................................................792
Shramik Sengupta, Rajagopalap Thiruvengadathan, Ryung Doo Lee, Brandon M. Smith, Suchadivi Puttausamw, Kenhab Gangopadhyay, Shubhra Gangopadhyay

Life Cycle Energy Analysis and Midpoint Assessment of Multimegawatt Wind Turbines with Polymer Nanocomposite Blade Material ..........................................................................................................................793
Laura A. Merugula, Bhuvik R. Bakshi, Vikas Khanna

Advanced Oxidation Processes with Carbon Nanotubes: Surface-Promoted Formation of Hydroxyl Radical During Ozonation ..................................................................................................................796
Rebekah L. Oulton, Michael J. Naalandian, Howard A. Fairbrother, Kevin Wepasnick, David M. Cwierty

Evaluating the Dynamics of An Integrated Electrokinetic and Zero-Valent Iron Nanoparticle System for Treatment of Hexavalent Chromium In Groundwater ........................................797
Ryan Thacher, Massoud Pirbazari

Biodegradation of Carbazole by Microbial Cells Coated with Magnetite Nanoparticles ................................................................799
Jiannin Xing

Developing Experimental and Computational Nuclear Forensics Signals of Fast Neutron Irradiation Facility At TRIGA Reactor .......................................................................................................................................800
Ian Schwerdt, Joseph Levinthal, Chris Dinces, Dong-Ok Cho, Luis Ortiz-R, Tatjana Jevremovic

Monte Carlo Simulation of Tritium Generation Signals In the Utah TRIGA Reactor for Nuclear Forensics ........................................806
Todd Sherman, Haori Yang, Tatjana Jevremovic

GEANT4 Simulation of Irradiation Facilities and Neutron Sources At University of Utah TRIGA for Nuclear Forensics and Detection .............................................................................................................................................813
Jennifer M. Leberknight, Amadumar Gaultum, Todd J. Menkenhaus

GEANT4 Model for Nuclear Forensic Analysis of Nuclear Detonation In Urban Environments ..............................................................826
Jeffrey Taylor, Haori Yang, Xue song Zhou, Tatjana Jevremovic

New Nuclear Forensics Education Program and Research At the University of Utah ........................................................................840
Tatjana Jevremovic

Integration of a Membrane Based Extraction Process Into a Lignocellulosic Biorefinery ................................................................849
David Grzenia, Dan Schell, S. Ranil Wickramasinghe

Modified Anapore™ Membranes for the Microfiltration of Cellulose Hydrolysis Mixtures .................................................................850
Yang Hong Zhao, Daniel F. Shantz

Polymer Enhanced Microfiltration of Lignocellulosic Hydrolyzates ...............................................................................................854
Rakesh Yasurla, Bandaru V. Ramara

Acetic Acid Removal From the Hydrolysate Using Reactive Extraction In a Membrane Extractor/Reactor ........................................855
Rahul Patil, Glenn Lipscomb, Frederick F. Stewart

Evaluation of Membrane Separations Opportunities within Lignocellulosic Biorefining Processes: Tailoring Membrane Properties ................................................................................................................................................856
Bhavin Bhayani, Bandaru V. Ramara

Membrane Filtration of Lignocellulosic Hydrolyzates: Comparison of Crossflow and Dead-End Microfiltration .................................858
Bai Xie, Mashiin Tu

Effect of Column Temperature On HPLC Separation of Acetic Acid and Leucinlic Acid ................................................................859
Jaron E. Park, Matthew S. Shannon

Towards Industrially Viable Non-Aqueous Amine Solvent Systems ..............................................................................................861
Jackson Switzer, Kyle Flack, Amy Rohan, Svetha Sivavaswamy, Elizabeth Biddinger, Manish Talreja, Manjusha Verma, Pamela Pollet, Charles Eckert, Charles Liotta

CO2 Separation From Coal-Fired Power Plants by Regenerable Mg(OH)2 Solutions ........................................................................862
Hari Krishna Bharadwaj, Joo-Toung Lee, Xiang Zhou, Les Cheng, Tim. C. Keener

Amino Acid Solvents for CO2 Absorption ........................................................................................................................................864
Le Li, Gary Rochelle

Evaluation of Modified Feedstocks for Deconstrctionability .................................................................................................867
Seema Singh

Discovery and Characterization of Cellulolytic Enzymes From the Wood Wasp Symbiont Streptomyces Sp. ActE ..................................868
Taichi E. Takasuka, Adam J. Brook, Cameron R. Currie, Brian G. Fox
Dissecting the Cellulosome Enzyme Complex: Assembly and Function ................................................................. 869
Construction of Efficient Gram-Negative Biocatalysts for Lignocellulose Conversion ............................................. 870
David Keating, Michael Schwalbach, Jeffrey Gardner, Mary Tremaine, Patricia Kiley, Robert Landick
One-Step Production of Lactate and Isobutanol From Pretreated Biomass by Recombinant Cellulolytic Bacillus
Subtilis
Xiaozhou Zhang, Chun You, Y.-H. Percival Zhang
Development of Alkene Biofuels ........................................................................................................................................ 872
Harry R. Bellor, Ke-Been Goh
Understanding the Evolution of by-Product Synergy Networks by Network Analysis ............................................. 873
Shweta Singh, Bhavik R. Bakshi
Optimal Rerouting of Traffic Flows for Resilient Management of Recharging Station Networks ............................... 874
Kris Villez, Craig Rieger, Venkat Venkatasubramanian
Scheduling of Multiple Chemical Plant Start-Ups for Minimizing Regional Air Quality Impacts ............................. 876
Tiansong Cai, Qiang Xu
Assessing Risks Due to Loss of Natural Capital: The Case of Pollination Services ..................................................... 877
Yikas Khanna, Bhavik R. Bakshi
Supply Chain Planning In Oil & Gas Industry: Energy and Clean Technologies Under Uncertainty .......................... 879
Ivan Ordóñez Sr., Ariel Uribe, Andrés Joaquín Calderon
Production of Concentrated Monosaccharide Solutions From Biomass Using CO2-H2O Mixtures At Varying
Temperatures .................................................................................................................................................................. 880
Jeremy S. Luterbacher, Jefferson W. Tester, Larry P. Walker
Structural Characterization of AHP-Pretreated Biomass ............................................................................................... 881
Mayang Li, David Hodge
Pretreatment of Corn Stover for Bioethanol Production Using Low-Moisture Anhydrous Ammonia (LMAA);
Ammoniation and Pretreatment .................................................................................................................................. 882
Chang Geun Yoo, Nhuan-John Nghiem, Kevin B. Hicks, Tae Hyeon Kim
Feedstock Mixture Effects On Sugar Monomer Recovery Following Dilute Acid Pretreatment and Enzymatic
Hydrolysis ........................................................................................................................................................................... 883
Michael J. Brodde-Campbell, Jordan Klinger, David Shonnard
Hydrolyzate De-Acidification Using Resin-Water Electrodeionization ...................................................................... 886
Yu-J. Lin, Saaraoy Datta, Michael Henry, Anthony Pracan, Seth Snyder
Biomimicry of the Fungal Consolidation of Biomass Pretreatment with Saccharification ........................................... 887
Justin T. Kaffemberger, Jonathan S. Schilling
Comparison of Photoreactor Designs for Oxidation of Dilute Aqueous Waste Contaminants ............................... 888
Amanda M. Gramas, Dorothy W. Shaf, Kevin C. Broadwater, Montanna Herdemian
Study of the Photodeposition of Noble Metal On BiOCl for the Photocatalytic Decomposition of Rhodamine B ................................. 889
Liang Kong, Zheng Jiang, Tiancan Xiao, Henry H.-C. Lai, Peter P. Edwards, Rebecca Nicholls
Alexander P. Mathews, Dambar B. Hamal, Paul Owings, Ken J. Klabunde
Visible-Light-Driven Photodegradation of Contaminants In Water Over Surface-Engineered BiOBr
Semiconductor Micro/Nano-Structures ............................................................................................................................... 896
Zheng Jiang, Liang Kong, Tiancan Xiao, Peter P. Edwards
Roland Fabrier, Inge K. Hermann, Evangelos K. Athanassission, Robert N. Grubbs, Wendelin J. Stark
Improved Photocatalytic Activity Under Visible Light Irradiation of Nanosized-TiO2 Co-Doped with Vanadium and
Nitrogen ............................................................................................................................................................................. 900
Renuka Jaiswal, Rupali Dhollam, Naimesh Patel, Antonio Miotello, Dushyan K. Kathari
Flexible Energetically Self-Sufficient Co-Production of Hydrogen and Formic Acid ........................................... 901
Jorge Pena Lopez, Vasilios Manousiouthakis
The Attractiveness of Ammonia Borane to Generate Hydrogen for PEM Fuel Cell Vehicles ................................. 902
Ahmad Ali-Khah, Huan Tae Hoang, Arvind Varma
Solar Thermochemical Hydrolysis of Metal Nitrides for H2 Production and Integrated Storage In Form of
Ammonia ........................................................................................................................................................................... 903
Ronald Michalaks, Peter Pfromm
Quantification of [Fe-Fe]-Hydrogenase, MrC A and FTHFS Gene In Mixed Anaerobic Cultures During Dark
Hydrogen Fermentation ...................................................................................................................................................... 905
Subha Rao Chaganti, Daniel D. Heath, Jerald A. Lalman
Hydrogen Car Fill-up: Thermodynamic Modeling Using the Generic Cubic Equation of State ................................. 907
Ronnick J. Banet,E. Cornely
Zero Liquid Discharge (ZLD) System for Flue-Gas Derived Water From Oxy-Combustion Process ........................... 908
Sivaram Harendra, Danylo Oryshchyn, Thomas Ochs, Stephen J. Gerdeem, John Clark
 Sorptive Removal of Copper and Lead From Aqueous Solution by An Fe-Mn Binary Oxide ...................................... 909
Lei Wang, Gaosheng Zhang, J. Paul Chen
Supported-Gas-Membrane Process for Removal and Recovery of Amines From Water Streams ............................... 910
Pengfei Shou, Liangping Liu, Yeqing Qin, Jie He
Recycling Biobutanol Spent Broth by Ultrafiltration ........................................................................................................ 912
Michelle Caravana Almendrala, Tian-Yang Shang
An Investigation Into the Use of Fluorinated Hydrating Agents In the Desalination of Industrial Wastewater ................. 920
C N. Petticrew, D. Ramjugernath, C. Buckley, Amir H. Mohammadi, P. Naidoo
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium-Loaded Photocatalysts for Removal of Organic Dyes From Wastewater Using Visible Light Irradiation</td>
<td>922</td>
</tr>
<tr>
<td>Comparison of Amine-Based Absorbents for Post-Combustion Carbon Capture</td>
<td>923</td>
</tr>
<tr>
<td>Study of CaO Carbonation for CO2 Capture Process</td>
<td>926</td>
</tr>
<tr>
<td>Multiphase Porous Medium Adsorption/Desorption Model for CO2 Capture Applications</td>
<td>928</td>
</tr>
<tr>
<td>Engineering Amine-Based Solid Absorbents for Carbon Capture From Dilute CO2 Streams</td>
<td>930</td>
</tr>
<tr>
<td>Development and Evaluation of a Novel Hot Carbonate Absorption Process with Crystallization-Enabled High Efficiency</td>
<td>931</td>
</tr>
<tr>
<td>Pressure Stripping for Post-Combustion CO2 Capture</td>
<td>931</td>
</tr>
<tr>
<td>Kinetics of CO2 Absorption Into Aqueous Potassium Carbonate Solution Promoted by Carbonic Anhydrase Enzyme</td>
<td>932</td>
</tr>
<tr>
<td>Environmental Risk-Relevant Molecular Modeling of Adsorbed NDMA In MFI Zeolites</td>
<td>933</td>
</tr>
<tr>
<td>Detection of Disinfection by-Products In Drinking Water Systems Via Biomimetic Metabolism</td>
<td>934</td>
</tr>
<tr>
<td>Electrolysis for Bromide Removal and Reduction In Formation Potential of Brominated Disinfection Byproducts From Drinking Water</td>
<td>935</td>
</tr>
<tr>
<td>A Simple Immuno-Assay to Detect Drugs of Abuse In Wastewater</td>
<td>936</td>
</tr>
<tr>
<td>Novel Microbial Fuel Cell Based Biosensor for Continuous Measurement of BOD (Biochemical Oxygen Demand) In Wastewater</td>
<td>937</td>
</tr>
<tr>
<td>Ultrafiltration/Nanofiltration Based Technique for the Removal of Endocrine Disruptors From Surface Water</td>
<td>941</td>
</tr>
<tr>
<td>The Importance of a Well-Designed Cross-Flow System In the Removal Study of Adsorbing Estrogens by Nanofiltration Membranes</td>
<td>946</td>
</tr>
<tr>
<td>SW-RO Membranes for the Removal of Ammonium Thiocyanate From Coking Wastewaters In Steel Manufacturing</td>
<td>948</td>
</tr>
<tr>
<td>Environmental and Economic Evaluation of Wastewater and Water Disinfection Technologies</td>
<td>949</td>
</tr>
<tr>
<td>Chemical Properties and Degradation Efficiency of Radio-Frequency Plasmas In Water</td>
<td>950</td>
</tr>
<tr>
<td>Determination of Bisphenols Using Ultraviolet Spectroscopy</td>
<td>951</td>
</tr>
<tr>
<td>Development of New Redox Flow Battery Systems</td>
<td>957</td>
</tr>
<tr>
<td>Study On Preparation and Characterization of the Composite Bipolar Plate for Vanadium Redox Flow Battery</td>
<td>958</td>
</tr>
<tr>
<td>Investigation On Electrode Reaction Mechanism for Vanadium Redox Flow Battery</td>
<td>962</td>
</tr>
<tr>
<td>Active Species Concentration Effects On Performance for a Non-Aqueous All-Vanadium Redox Flow Battery</td>
<td>968</td>
</tr>
<tr>
<td>Energy Storage and Generation From Thermopower Waves: Covalently Functionalized Thermal and Electrical Conduits</td>
<td>970</td>
</tr>
<tr>
<td>Fouling and Cleaning Behavior of Forward Osmosis Membrane</td>
<td>971</td>
</tr>
<tr>
<td>Permeation of Interacting Solutes In Forward Osmosis</td>
<td>972</td>
</tr>
<tr>
<td>Network-Based Finite Element Analysis for Studying the Effect of Support Structure On Internal Concentration Polarization During Forward Osmosis</td>
<td>973</td>
</tr>
<tr>
<td>New Approaches to Forward Osmosis Membrane Design</td>
<td>974</td>
</tr>
<tr>
<td>Development of a Pilot-Scale Forward-Osmosis Desalination Process</td>
<td>975</td>
</tr>
<tr>
<td>Zero-Energy Osmotic Water Purifier for Ethiopia: Providing Clean Drink to Vulnerable Populations</td>
<td>976</td>
</tr>
<tr>
<td>The Role of Cellulose Accessibility On Enzymatic Saccharification of Lignocellulosic Rhamnolipids</td>
<td>978</td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Nickel Hydroxide</td>
<td>979</td>
</tr>
<tr>
<td>Influent Solids Retained High Biomass Reactor Treating Dairy Manure</td>
<td></td>
</tr>
<tr>
<td>Wastewater and Kinetics Study</td>
<td></td>
</tr>
<tr>
<td>Starvation of a Mixed Culture of Chlorella Vulgaris and Scenedesmus</td>
<td></td>
</tr>
<tr>
<td>Sp. for Enhanced Removal of Ammonia</td>
<td></td>
</tr>
<tr>
<td>Transport and Remediation of Chromium (VI) In Groundwater Using</td>
<td></td>
</tr>
<tr>
<td>An Integrated Electrokinetic and</td>
<td></td>
</tr>
<tr>
<td>Municipal Wastewater Treatment Using Electrocoagulation and Adsorption</td>
<td></td>
</tr>
<tr>
<td>For Reuse In Industrial Processes and</td>
<td></td>
</tr>
<tr>
<td>Toward Sustainability and Low Cost In Electro-Dialysis</td>
<td></td>
</tr>
<tr>
<td>Desalination of the Colorado River Water: A Hybrid Approach</td>
<td></td>
</tr>
<tr>
<td>Toward Sustainability and Low Cost In Electro-Dialysis Reversal</td>
<td></td>
</tr>
<tr>
<td>Desalination</td>
<td></td>
</tr>
<tr>
<td>Municipal Wastewater Treatment Using Electrocoagulation and Adsorption</td>
<td></td>
</tr>
<tr>
<td>for Reuse In Industrial Processes and</td>
<td></td>
</tr>
<tr>
<td>Green Areas</td>
<td></td>
</tr>
<tr>
<td>Fermentation of Glucose</td>
<td></td>
</tr>
<tr>
<td>Production of Cellulosic Ethanol</td>
<td></td>
</tr>
<tr>
<td>The Hydrolysis of Nylon6 In Ionic Liquid to Recycle Nylon Waste</td>
<td></td>
</tr>
<tr>
<td>Process Development for Efficient Utilization of Waste Plastic to</td>
<td></td>
</tr>
<tr>
<td>Liquid Product for Rural Development In</td>
<td></td>
</tr>
<tr>
<td>Nigeria: Gasification Option</td>
<td></td>
</tr>
<tr>
<td>An Aerobic Bacterial Treatment of Corn Stover to Prepare a Biorefining</td>
<td></td>
</tr>
<tr>
<td>Feedstock</td>
<td></td>
</tr>
<tr>
<td>Towards Developing Anaerobic Digestion Based Biorefinery – Research</td>
<td></td>
</tr>
<tr>
<td>On Food Wastes As Feedstock</td>
<td></td>
</tr>
<tr>
<td>Development and Testing of an Asymmetric Supercapacitor Based on a</td>
<td></td>
</tr>
<tr>
<td>Carbon Foam Electrode Impregnated with Nickel Hydroxide</td>
<td></td>
</tr>
<tr>
<td>Effects of Annealing On Zr2Ni4X2 (X = Ni, Mg, Al, Sc, V, Mn, Co, Sn,</td>
<td></td>
</tr>
<tr>
<td>La, Hf) for Ni/MH Battery Operation</td>
<td></td>
</tr>
<tr>
<td>Optimal Charge Rates for a Lithium Ion Cell</td>
<td></td>
</tr>
<tr>
<td>Basic Model of Secondary Zinc Air Batteries to Quantify Environmental</td>
<td></td>
</tr>
<tr>
<td>Novel O2/H2O-Selective Membrane for Metal/Air Batteries</td>
<td></td>
</tr>
<tr>
<td>Desalination of the Colorado River Water: A Hybrid Approach</td>
<td></td>
</tr>
<tr>
<td>Toward Sustainability and Low Cost In Electro-Dialysis Reversal</td>
<td></td>
</tr>
<tr>
<td>Municipal Wastewater Treatment Using Electrocoagulation and Adsorption</td>
<td></td>
</tr>
<tr>
<td>for Reuse In Industrial Processes and</td>
<td></td>
</tr>
<tr>
<td>Green Areas</td>
<td></td>
</tr>
<tr>
<td>Transport and Remediation of Chromium (VI) In Groundwater Using An</td>
<td></td>
</tr>
<tr>
<td>Integrated Electrokinetic and Nanoscale Particle Technology</td>
<td></td>
</tr>
<tr>
<td>Starvation of a Mixed Culture of Chlorella Vulgaris and Scenedesmus</td>
<td></td>
</tr>
<tr>
<td>Sp. for Enhanced Removal of Ammonia</td>
<td></td>
</tr>
<tr>
<td>From Wastewater Effluent And Its Impact On Lipids Formation</td>
<td></td>
</tr>
<tr>
<td>Influential Solids Retained High Biomass Reactor Treating Dairy Manure</td>
<td></td>
</tr>
<tr>
<td>Wastewater and Kinetics Study</td>
<td></td>
</tr>
<tr>
<td>Author Index</td>
<td></td>
</tr>
</tbody>
</table>