

# **Student Poster Sessions 2016**

Core Programming Area at the 2016 AIChE Annual Meeting

San Francisco, California, USA  
13 - 18 November 2016

ISBN: 978-1-5108-3448-4

**Printed from e-media with permission by:**

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



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

Copyright© (2016) by AIChE  
All rights reserved.

Printed by Curran Associates, Inc. (2017)

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: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

**Complete author information not provided in the original digital media.**



# TABLE OF CONTENTS

Developing a Scalable System to Harvest Critical Materials from Industrial Waste with <i>Gluconobacter Oxydans</i> .....	1
Determination of Temperature Parameters for Optimization of a Plastic Pyrolysis Process for Fuel Oil .....	2
A Sustainable Approach to Biodiesel Waste Minimization By Closing the Loop on Production .....	3
Comparison of Cold Flow Properties Between Fatty Acid Methyl Esters and Fatty Acid Ethyl Esters .....	4
Use of Aerial NDVI Imagery in Determining Plant Water Status of Individual Grape Vines .....	5
Effect of Zinc Telluride- Tungsten Oxide Composite for Water Splitting Using Cathodic Electrodeposition on Tin-Indium Substrate .....	6
Solar and UV Treatment of Human Waste to Yield NPK Plant Fertilizer .....	7
Use of Lignin Biochar As a Catalyst Support .....	8
Optimized Hydrothermal Liquefaction for High- and Low-Lipid Algae .....	9
Exploiting Natural Processes to Reduce the Need for Petroleum-Based Fertilizers: The Role of Bacterial Chemotaxis in Nitrogen Fixation of Leguminous Plants .....	10
Resolving the Kinetic Parameters of Cellulose Pyrolysis .....	11
Physicochemical Characterizations of Distillate Fractions of Biocrude Oil Converted from Wet Biowaste Via Hydrothermal Liquefaction .....	12
Unraveling the Interactions of Homogenous Lewis Acid Catalyst (Aqueous Tin(IV) Chloride) Species with Glucose By Means of Raman Spectroscopy .....	13
Theoretical Investigation of the Decomposition of Glycerol over Pt(111) .....	14
Theoretical Investigation of the Degradation Pathway of Phosphorus Containing Nerve Agents on Metal Oxides .....	15
Loop Reactors - Revolutionizing Reaction Engineering .....	16
O-Nitrophenyl Cellobioside As an Active Site Probe for Family 7 Cellobiohydrolases .....	17
Robust Catalyst for the Dehydrogenation of Formic Acid .....	18
Nickel and Iron Catalysts Supported on Cellulose-Based Carbon Aerogels: An Application of Bcfp .....	19
Self-Supporting Monoliths from Hollow Core-Shell Ni@SiO <sub>2</sub> Nanostructures .....	20
Preparing Supported Metal Catalysts Coated with Thiols and Phosphonates .....	21
Effect of Pore Structure on CO <sub>2</sub> Adsorption Characteristics of Aminopolymer Impregnated MCM-36 .....	22
Catalytic Analysis of Copper Porphyrine in the Conversion of Methane to Methanol through Computer Simulations .....	23
High Pressure High Temperature Annealed TiO <sub>2</sub> for Photocatalytic Biomass Reforming .....	24
Direct Catalytic Coupling and Selective Oxidation of Methane to Ethanol at Low Temperature .....	25
Studies on Urease Mediated Nanoparticle Formation .....	26
DFT Study of the Catalytic Activity of Cu-MFI Zeolite and the Role of the Substitution Sites of Aluminum Atoms .....	27
Solid Acid Catalytic Dimerization of Ethylene to Butenes .....	28
Synthesis and Characterization of Nickel Catalysts for Methane Tri-Reforming .....	29
Functionalized Boron Nanoparticles: Characterization of Thiol-Ene Click Chemistry .....	30
Design of Highly Efficient Bifunctional Metal-Organic Framework Catalysts for Tandem Catalysis By Shortening the Reaction Pathway .....	31
Selective Dehydrogenation of Ethanol Using Single Atom Alloy Catalysts .....	32
Surface Spectroscopic Study of Renewable Ethylene Glycol Synthesis over Silicon Dioxide-Supported Metal Catalysts .....	33
Catalytic Materials for Demetallation of Algal Biocrude .....	34
Catalytic Application of Few Layer MoS <sub>2</sub> .....	35
Site and Structural Changes to Sn-Beta Zeolites in Aqueous Media and Their Consequences for Glucose Isomerization Catalysis .....	36
Investigation of Fluidized Bed Agglomeration of Cu-Based Oxygen Carriers .....	37
Heterogeneous Catalyzed Esterification of Caproic Acid and Lauric Acid with Isoamyl Alcohol from Fusel Oil .....	38
Solvent Effects During Acid-Catalyzed Esterification Reactions .....	39
Characterization of ALD Fuel Cell Catalysts Using Durability Testing and Electrochemical Impedance Spectroscopy .....	40
Exchange Kinetics of Quinolinyl Ketones with Boronic Acids Via Rhodium Catalyzed C-C Bond Activation .....	41
Redox Active Material Development and Testing for Efficient Solarthermal Water Splitting .....	42
Characterization and Stability of Metal Oxide Supported Cobalt Nanorod Catalysts for CO <sub>2</sub> Hydrogenation .....	43
Synergistic Interactions Between Copper and Iron Oxide during the HT-WGS Reaction .....	44
Partial Oxidation of Methane on Nickel Carbide Catalysts .....	45
Electrochemical Reduction of Carbon Dioxide to Formic Acid in Ionic Liquid [Emim][N(CN) <sub>2</sub> ]/Water System .....	46
Size Control of Colloidal Pd Nanoparticles: Role of Ligand Binding Strength .....	47
Synthesis of Platinum/Ceria Catalyst Using Supercritical Fluid Deposition .....	48
Novel Synthesis of CHA Zeolites .....	49

Catalytic Conversion of Bioethanol to 1,3-Butadiene.....	50
Investigating Ligand-Nanoparticle Interactions and Catalytic Activity through Organic-Aqueous Tunable Solvents Recovery .....	51
Engineering Bilayer Electrolytes in Solid Oxide Electrolysis Cells .....	52
Analysis of the Electrocatalytic Activity of Nickelate Oxides As Cathode Electrocatalysts for Li-Air Batteries.....	53
Exploration of Viable Methods to Form 1-Thia-3,4-Diazolidine-2,5-Dione (TDAD) Based Polymers.....	54
Dehydration and Condensation of Furfuryl Alcohol to Light Oligomer over Molybdenum Oxide Catalysts: Effect of Loading and Reaction Time.....	55
Molecular Simulation of Alkaline Earth Halide Salt Solutions in Water and Organic Solvents.....	56
Relating Conductivity and Tortuosity through Modeling of Infiltrated Solid Oxide Fuel Cells.....	57
A Comparative Study of Photosynthetic Unit (PSU) Models for Algal Growth Rate and Fluorescence Prediction Under Light/Dark Cycles.....	58
Application of the Noh Problem to Al, Fe, W, Cu .....	59
Genetic Algorithm Lead Discovery of Nanoparticle Structures .....	60
Modeling and Control of Crystallization Kinetics.....	61
Multiplexing Techniques for High-Throughput Gas Chromatography .....	62
Understanding the Transferability of the Optimized Potentials for Liquid Simulations (OPLS-AA) .....	63
#####Understanding Water Effects in Alcohol Dehydration Activity on $\gamma$ -Al <sub>2</sub> O <sub>3</sub> Using Microkinetic Modeling.....	64
Modeling Ultracool Brown Dwarfs with the James Webb Space Telescope.....	65
Advanced Model Predictive Feedforward/Feedback Control of a Tablet Press .....	66
Modeling and Simulation of Pollution Control Units for Improved Sustainability: A Styrene Production from Ethylbenzene Case Study.....	67
Modeling, Simulation, and Control of a Supercritical Coal-Fired Power Plant for Smart Grid Applications .....	68
Chemical Game Theory: An Approach for Modeling Strategic Decisions .....	69
Design and Construction of Pilot Scale Tangential Flow Filtration Unit.....	70
Developing a Molecular Model to Predict Equations of States from Computational Quantum Chemistry and Machine Learning .....	71
Molecular Dynamics Determination of the Effects of Correlated Hopping on the Kinetic Monte Carlo Epitaxial Growth Patterns on Ni(111) Versus Ni(100).....	72
A Monte Carlo Model of Nanomaterial Toxicity .....	73
Software Package for Non-Uniform Sampling.....	74
Molecular Dynamics Modeling of Water and NaCl Transport in Sulfonated Poly(Arylene Ether Sulfone) Desalination Membranes .....	75
Encapsulation of Microbes and Slow Release Substrate for Bioremediation of Chlorinated Solvents .....	76
Effect of Surfactants on Cloud Condensation Nuclei .....	77
Tetraethylenepentamine Functionalized Ti-MCM-36 for Carbon Dioxide Capture .....	78
Generation and Use of a Pure Titanium Pillared MCM-36 Structure As a High Efficiency Carbon Dioxide Capture Platform.....	79
Watershed and Lake Bio-Geochemistry: Movement of Phosphorus and Sediments from Forested Areas into Water Bodies.....	80
Analysis of the Impact of the Environmental Noise in the Academic University Communities: Study of Case .....	81
Direct Measurement of Aerosol Surface Tension As a Function of Humidity .....	82
Influence of Physical Microstructure and Surface Properties on the Drying Rate of Water from Simulated Soil Micromodels.....	83
Photocatalytic Oxidation-Based Water Treatment Using Nano-Structured TiO <sub>2</sub> Electrode: Co-Catalyst Vs. Non-Ferric Fenton.....	84
Variability of Electronic Cigarette Particle Size Distributions and the Effects of Background Air.....	85
Particle-Induced Gamma-ray Emission (PIGE) as a Novel Detection Method for PFAS in Personal Care Products .....	86
Measurement & Flux Modeling of Lake Michigan's Polychlorinated Biphenyl (PCB) Content Near Chicago .....	87
Efficiency of Bimetallic Nanoparticles for Treatment of Orange G in Water.....	88
Temporal Stability of Microbial Water Quality in Wye Island Irrigation Pond .....	89
A Low Cost Solution for Recycling K-Cups and Reducing the Problem of Waste Plastic in American Landfills .....	90
Concentration and Microbial Dechlorination of Polychlorinated Biphenyls in Wastewater .....	91
Improving the Estimates of Particulate Matter Impact on Human Health through Remote Sensing .....	92
Eliminating a Flammability Risk in High-Level Radioactive Waste Processing .....	93
Biomass Fueled Multiple Effect Distillation Unit for Water Desalination.....	94
Re-Emission of Mercury from Activated Carbon in Coal Combustion Flue Gas.....	95
The Effect of Relative Humidity on Secondary Organic Aerosol Formation .....	96
Synthesis of Magnetic Iron OXIDE CORE-Shell Nanoparticles with Tunable Coating Thickness for Enviromental Remediation .....	97
Solar UV Disinfection of Drinking Water.....	98
Analysis of Hydrothermal Carbon By Raman Spectroscopy .....	99
Modeling Anaerobic Digestion of Biodegradable Solid Wastes .....	100

A New Laboratory-Scale Device for Investigating Human Health Impacts of Biomass-Fired Domestic Cookstoves .....	101
Effect of Elevated Ammonia Concentrations on Secondary Organic Aerosol Formation during the Georgia Tech Ambient Field Study in Yorkville, Georgia .....	102
Implementation of the Argonaute Genome Editing Protein in Lactococcus Lactis.....	103
Bacteriophage Activity on Paper Depends on Paper Properties and Immobilization Method .....	104
A Look at the Recrystallization of Drug out of Supersaturated Amorphous Dispersions .....	105
Encapsulation of UV Sensitive Substances in Polymer Particles and Related Coating Applications .....	106
Kinetics of Growth and Biofilm Formation of Vibrio Cholerae in Presence of Potential PTS Modulating Chemical Compounds.....	107
Optimizing Targeted Drug Delivery to Polarized Macrophages Via Arginine-Based Surface Modifications of Liposomes .....	108
The Effects of Drug Treatment on Cellular Mechanics in Metastatic Breast Cancer Cells .....	109
Engineering Medium Chain Volatile Ester Biosynthesis By Eeb1 in S. Cerevisiae .....	110
Electrochemical Detection of DNA Methylation and Application to Breast Cancer Screening .....	111
Engineering a High Throughput Method for Quantitative Analysis of Behavioral Neuromodulation in C. Elegans .....	112
Optimizing an Electrospinning Process of Thermoresponsive Polymer-Protein Composite Nanofibers for Cell Culture .....	113
Development of a Portable, Inexpensive Assay to Detect Antibiotic Resistance .....	114
Ligand-Induced Activation of an Engineered Viral Fusion Protein .....	115
Assembling Mucus-Penetrating Antibiotic Nanoparticles from Hydrophobic Ion-Pairing Based Flashnanoprecipitation of Hydrophilic Actives .....	116
Detection of Carotenoids Using Electrochemical Impedance Spectroscopy .....	117
Gold Templated Indicator for Ionizing Radiation.....	118
Forward Genetic Screens for the Discovery of Functional Glucan Hydrolases in the Diatom Phaeodactylum Tricornutum .....	119
Measuring the Nanomechanical Properties of Tomato Cuticles Using Atomic Force Microscopy .....	120
Comparison of MACS and FACS Sorting of Sca-1+ Cells from Mouse Bone Marrow .....	121
Process Development and Modeling of a Continuous Biphasic Liquid-Liquid System.....	122
Computational Fluid Dynamics Analysis of the Carotid Artery.....	123
Liquefaction Process Optimization in the Enzymatic Hydrolysis of Starch Materials .....	124
Optimization of Process Variables for Design Ankyrin Repeat Proteins in Alzheimer's Diagnostic Applications.....	135
Advancing Capstone Projects Beyond the First Generation: An Emergency Rapid Injection Device.....	136
Analysis of Hypoxia in U87 Glioblastoma Suspension Cultures .....	137
Gingivitis Prevention: Integration of Iron (II, III) Oxide Nanoparticles into Commercial Mouthwash .....	138
Stability of Copper Modified Electrochemical Surfaces During L-Arginine Detection .....	139
Delivery of Model Lipophilic Compounds from Poloxamer 407 Thermoreversible Gels.....	140
Obtaining and Purification of Crude Extracts with Cellulase and Laccase Enzymatic Activity from an Isolated Strain of Fusarium Spp.....	141
Photoacoustic Imaging of cRGD Targeted Nanoparticles in a Lewis Lung Carcinoma Tumor Model.....	142
High-Efficiency Capillary-Driven Plasma Separation with Porous Filter Materials for Point-of-Care Plasma Sampling .....	143
Dielectrophoretic Response of Condensed DNA Clusters in AC Fields .....	144
Expression and Purification of Plant Embryogenic Proteins .....	145
The Analysis of Keratins/Chitosan Photocrosslinked Biomaterials for Bone Tissue Repairing .....	146
Structural Investigations of Caffeine Metabolic Enzymes.....	147
Uranium Concentration Analysis By Visible Absorption Spectroscopy- Temperature and Solution Matrix Control .....	148
Screening on Xylitol Production with Different Colombian Native Yeasts.....	149
Determination of the Best Conditions of Biodiesel Production with Free Form Lipases on Refining Palm Oil to Laboratory Scale .....	150
The Formation of Vesicles through the Modification of Tyrosine-Derived ABA Tri-Block Copolymer Membranes.....	151
Characterizing Mammalian Cell Shear Sensitivity to Improve Cell Culture Bioreactor Efficiency .....	152
Development of Nanoparticle Encapsulation for Targeted Drug Delivery.....	153
The Effect of Poly (Beta Amino Ester) and Dopamine Coatings on the Surface Activity of Iron Oxide Nanoparticles .....	154
Optimization of a NG-Hydroxy-L-Arginine Electrochemical Sensor .....	155
Pentablock Copolymer Mediated Crispr/Cas9 Delivery Strategies in Astrocyte Type Cells Transdifferentiated from Mesenchymal Stem Cells for in Vitro Gene Therapy .....	156
3D Printed Microfluidic Platform for Non-Invasive Smart-Agriculture Sample Collection.....	157
Self-Assembling Paclitaxel Nanofibers for Controlled Drug Release.....	158
Albumin Extraction Process from Bovine Blood SERUM.....	159
Chondrogenic Differentiation Potential of Human Adipose Stem Cell Spheroid Forming on Glycol Chitosan and Gelatin Hydrogel .....	160
Characterization of an Electrostatic-Based Air Sampler for the Capture of Airborne Norovirus.....	161

Dynamic Tissue Culture Model for Ex Vivo Recreation of the Mechanical Microenvironment of the Lung .....	162
Thermally Triggered Drug Release from Injectable Hydrogel Composite for Local Chemotherapy Delivery to Tumors .....	163
Biodiagnostic Assay Using Multibranching Gold Nanoantennas for Ultra-Sensitive Biomarker Detection Via Sandwich Architecture.....	164
Coarse-Grained Simulations of the Self-Assembly of Skin-Relevant Lipid Structures .....	165
Identifying Differential Gene Expression in Cytotoxic T Cells Induced By B16F0 Melanoma Exosomes .....	166
Development of a Microinjection Platform for Chlamydomonas Reinhardtii.....	167
Incorporation of Benzalkonium Chloride to Improve the Antimicrobial Properties of Lignocellulosic Material.....	168
An Image Analysis Tool for Mapping Cilia-Driven Particle Crystallization.....	169
Isolation and Identification of Hypoglycemic Agents from the Costus Family of Plants .....	170
Revealing Ultrafast Structural Motions of the GFP Model Chromophore in Solution.....	171
Characterizing Cell-Free Metabolism through Physicochemical Optimization for Biosynthetic Pathway Engineering .....	172
Enzyme-Based Conjugates Capable of Bacterial Decontamination .....	173
Biosynthesis and Purification of Nicotinamide Adenine Dinucleotide for Mechanistic Studies of Toxins.....	174
Chondrogenesis of Encapsulated MSCs.....	175
Perfusible Cells .....	176
The Effect of Calcium Chloride in Modified CHO Cell Growth for Antibody Expression.....	177
Geometric Tools for Controlling Platelet Adhesion .....	178
Investigation of the HP1-SUV39H1 Interaction in S. Cerevisiae .....	179
Optimizing Nanoparticle Surface Characteristics to Minimize in Vitro Cytotoxicity .....	180
Studying Breast Cancer Metastasis Via the Effect of Breast Cancer Cells on Endothelial Cells.....	181
Optimization of Biomaterial Microenvironment for Motor Neuron Tissue Engineering.....	182
Synergistic IL6/8 Paracrine Signaling Pathway Informs New Strategy to Prevent Cancer Metastasis through Inhibition of Cell Migration .....	183
Electrospinning Stimuli-Responsive Fibers at the Nanoscale As Functional Drug Delivery Mats .....	184
Xylitol: Low-Calorie Sweetener.....	185
Optimizing Expression of Therapeutic Antigen-Binding Fragments (Fab) in E. Coli .....	187
Surface Characterization of WLBu2 and GP34 Chemically Immobilized on to Tcvs Modified SiO2.....	188
Distillation Process Understanding from Analytical Monitoring and Computational Modeling .....	189
Role of Gradient Microenvironments in Supporting Termite Gut Community Diversity .....	190
Ionic Liquids for Controlled-Release Drug Delivery: Synthesis and Solubility .....	191
Theory-Driven Synthesis of Surface-Modified Nanoparticles for Biochemical Applications.....	192
Biocompatibility and Biodegradation of Sensors Enabled By Zinc Oxide Thin Films.....	193
Development of a "Mix and Read" Assay for Target Detection Using Split-Luciferase Reconstitution .....	194
Influence of Electrostatic Interactions on Particle Tracking for Microrheology Analysis .....	195
Development of Nanoclusters Using Tannic Acid-Coated Ultra-Small Iron Oxide Nanoparticles for Simultaneous MRI Imaging and Drug Delivery.....	196
Evaluation of Curcumin-Loaded Nanoliposomes for the Treatment of Age-Related Macular Degeneration .....	197
Passive Mechanical Properties of Polymer-Coated Cells for High Speed Sorting Using Antigen Specific Lysis (ASL).....	198
Biocompatibility of 3D Printer Material to Bacterial Cultures.....	199
#####Optimization of the ?-Synuclein Antibody Stability through the Isoelectric Point for Parkinson's Disease Applications.....	200
Polymer Nanoparticles Co-Coated with Antibodies and Anti-Phagocytic Moieties Improve Specific Interactions and Uptake By Target Versus Phagocytic Cells.....	201
Alternative ELISA Using an RNA Aptamer Against Calf Intestinal Alkaline Phosphatase .....	202
Enhancing Ethanol Production with RNA-Engineering of Zymomonas Mobilis .....	203
Cross-Linking Amyloid Forming Proteins for Improved Understanding of Early Aggregation.....	204
Engineering of a Stable Myosin Neck Fragment for Understanding the Consumption of Energy in Resting Muscle .....	205
PLGA Encapsulation of Apocynin .....	206
Optimizing the Quality and Throughput of Electrospun Poly(Glycerol Sebacate) Vascular Grafts .....	207
Mechanical Properties of Spherical Alginate Hydrogels .....	208
Reducing Fibrous Encapsulation of Implanted Devices Using Biomaterials.....	209
An Improved Method to Edit Undomesticated Lactobacilli Strains Using Crispr-Cas9 Systems .....	210
Multivalent Cation-Triggered Folding of Hydrogel Sheets .....	211
Effect of Rock Inhibition on Mass Transport in Mesenchymal Stem Cell Aggregates Undergoing Chondrogenesis .....	212
Effect of Nodal Status Compared to Tumor Response after Neoadjuvant Radiation on Outcomes for Patients with Esophageal Cancer .....	213
Foaming Agents for Drug Delivery to Treat Inflammatory Bowel Disease .....	214
Interleaflet Coupling Effects in Supported Lipid Membranes.....	215
Lactic Acid Fermentation of Sporolactobacillus in Glucose and Biomass-Derived Sugars.....	216

Effects of PLGA Composition, Concentration and BSA Loading on Electrospun Nanofiber Geometry and Controlled Drug Release.....	217
#####Rapid Uptake and Ubiquitination of Fluorescent Peptides into Mammalian Cells Using a $\alpha$ -Hairpin Sequence Motif.....	218
Anti-Angiogenic Properties of Biofunctionalized Silver Nanoparticles .....	219
Optimized Approach to Synthesize Ultra Small Gold Nanorods to Target Nanospaces.....	220
Rheology of Bovine Cervical Mucus.....	221
Protein Nanocarrier for Targeted Intracellular Delivery of Functional Antibodies .....	222
Development of a Stimulus Responsive, in-Situ Forming, Nanoparticle-Laden Hydrogel Formulation for Ophthalmic Drug Delivery .....	223
Development of a Microfluidic Device to Quantify Algal Chemotaxis.....	224
Quantification of Alkaline Phosphatase Activity in Single Algal Cells Utilizing a Microfluidic Device.....	225
Investigating the Effect of Hydrogel Thickness on Bacterial Adhesion .....	226
Kinetic Study of Catalytic Decarboxylation/Decarbonylation of Triglycerides to Fuel-like Hydrocarbons .....	227
A Two-Step Approach to Demetallation of Algal Biocrude.....	228
High Temperature Measurements of the Reaction of Heptanone Isomers with Hydroxyl Radicals.....	229
Bio-Briquette Production As Renewable Energy from Waste of Banana Peels and Adhesive of Molasses.....	230
The Effect of Cyclic Molecules and Branched Alkanes on the Gelation of Petroleum-like Solutions .....	231
Synthesis of Lithium Titanium Oxide-Based Composite As Anode Material for High Performance Lithium Ion Batteries.....	232
Establishing a Co-Culture System for Clostridium Cellulovorans and Clostridium Aceticum for High Efficiency Biomass Transformation .....	233
Removing Roadblocks to Make the Conversion of CO <sub>2</sub> Emissions to Diesel and Jet Fuel Using Algae an Industrially Viable Process.....	234
Tailoring Electrolyte Composition to Improve the Activity and Energy Efficiency for the Electroreduction of CO <sub>2</sub> to CO.....	235
Heat Transfer in Rotary Drums Via Conduction, Convection, and Radiation .....	236
The Effects of Additives on the Cold Flow Properties of Biodiesel.....	237
Biodiesel Production from Jatropha curcas: Experimental Investigation and Process Simulation .....	238
A Promising Anhydrous Proton Transport Membrane: Hydroxyl Functionalized Graphane.....	239
Constructing and Testing a Photobioreactor Designed for Precise Characterizations of Growth of Microalgae for Biofuel Applications .....	240
Butanol Production from Corn Residue Using the Simultaneous Saccharification and Fermentation Method with Genetically Modified Clostridium Cellulovorans .....	241
Palm Kernel Shell (PKS) of Oil Palm Waste Pyrolytic Bio-Oil for Bio-Fuel Products .....	242
Effect of Temperature on the Conversion of Triolein to Biodiesel Via a Heterogeneous Acid-Catalyzed Interesterification Reaction .....	243
Ultrasonic Pretreatment of Microalgae for Enhanced Lipid Extraction .....	244
Structural and Functional Analysis of Spinel in Energy Storage Devices.....	245
Impact of Flow Rate and Flow Field Design on Redox Flow Battery Performance .....	246
The Effects of Convection on Combustion of Nanoparticle Infused Fuels .....	247
Using Wasted Thermal Energy to Improve Home Appliances Performance and Reduce Electric Power Consumption .....	248
Catalytic Combustion of Bio-Diesel over Perovskite Catalyst.....	249
Modeling the Limiting Efficiency of Perovskite/Lead-Sulfide Quantum Dot Tandem Solar Cells .....	250
A Theoretical Study of Sulfur Adsorption on Ion-Exchanged Mesoporous Y Zeolites.....	251
Catalyzed Deposition of CNTs on Carbon Felt for Flow Batteries and Fuel Cells.....	252
Towards the Development of a Polysulfide-Polyiodide Redox Flow Battery .....	253
Analysis on the Feasibility of Oxidative Dehydrogenation of Ethane with Electrochemical Means .....	254
PEDOT Encapsulated Fe <sub>3</sub> O <sub>4</sub> Nanorod Cathodes for High Energy Lithium-Ion Batteries.....	255
An Investigation on the Effect of Neutral Red Concentration on Voltage and Current Outputs for Microbial Fuel Cells.....	256
The Effects of Algae Growth Stage on Biocrude Characterization from Hydrothermal Liquefaction Using Chlorella Kessleri Algae .....	257
Gas Oil Separation Plant Optimization in North Ghawar Producing Department.....	258
Development of High Performance Liquid Chromatography for Lanthanide Separation.....	259
Functionalized Composite Silica Thin Film Membrane for Biomimetic Separations .....	260
Mg/DOBDC MOF Functionalized with Ethylene Diamine for Improved Resistance to Humidity in CO <sub>2</sub> Capture Applications.....	261
Adsorption Properties of Doxycycline Antibiotic from Aqueous Solutions Onto Pristine, Activated and Magnetized Carbon Nanotubes.....	262
Graphene Oxide Quantum Dot Enhanced Nanofiltration Membranes for Water Purification .....	263
Development of Structured Packing Via Additive Manufacturing .....	264
Nanostructured Membranes for Water Application .....	265

<b>Tailoring the Hydrophilicity of Electrospun Membranes for Water Filtration</b> .....	266
<b>Recovery of Dilute Aqueous Butanol By Membrane Vapor Extraction with Dodecane or Mesitylene</b> .....	267
<b>Crystallization and Phase Transformation Kinetics of Suberic Acid Particles Formed Via Monodispersed Droplet Evaporation</b> .....	268
<b>Separation of Racemic Penicillamine on Chiral Gold Nanoparticles</b> .....	269
<b>A 3-D Printed Scaffold for Improving Coating Efficiency in Electrospun Membranes for Membrane Distillation Applications</b> .....	270
<b>Removal of <sup>210</sup>Po from Groundwater for Nuclear Astrophysics Applications</b> .....	271
<b>Improving the Performance of a Liquid-Liquid Extraction Unit By Using Optimum Solvent</b> .....	272
<b>Thermodynamic Analysis of 1-Cyclhexylpiperidine for SPS FO Water Treatment Processes</b> .....	273
<b>Seawater Desalination and Industrial Wastewater Recovery Using Hybrid Forward and Reverse Osmosis at the Pilot System Level</b> .....	274
<b>Defluoridation of Drinking Water through Adsorption Using Naturally Occurring Zeolites</b> .....	275
<b>Applying Basic Chemical Reaction to in-House Water Treatment</b> .....	276
<b>Fabrication of Non-Fluorinated Hydrophilic-Oleophobic Stainless Steel Meshes for Oil-Water Separation</b> .....	277
<b>Textile Wastewater Treatment By Bioinspired Antimicrobial Nanofiltration Membranes</b> .....	278
<b>Author Index</b>	