

International Seminar on Chemical Engineering Soehadi Reksowardojo (STKSR 2020)

IOP Conference Series: Materials Science and Engineering
Volume 1143

Online
16-17 November 2020

ISBN: 978-1-7138-4619-2
ISSN: 1757-8981

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.

This work is licensed under a Creative Commons Attribution 3.0 International Licence.
Licence details: <http://creativecommons.org/licenses/by/3.0/>.

No changes have been made to the content of these proceedings. There may be changes to pagination and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2022)

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

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

TABLE OF CONTENTS

Preface	
Peer review declaration	
Effect of Bubble Size on Electrochemical Reduction of Carbon dioxide to Formic Acid	1
<i>Pramujo Widiatmoko, Wibawa Hendra Saputera, Hary Devianto, Isdiriyani Nurdin, Esperanza Rivana, Albert Angkasa</i>	
An overview of synthetic polymer-based membrane modified with chitosan for direct methanol fuel cell application	6
<i>S R Adiyar, A Satriyatama, A N Azjuba, N K A K Sari</i>	
The synthesis of magnetic molecularly imprinted polymer against di-(2-ethylhexyl)phthalate.....	16
<i>Asyifa Rizqi Utami, Muhammad Ali Zulfikar, Deana Wahyuningrum</i>	
Production of activated carbon from palm empty fruit bunch as supercapacitor electrode material	22
<i>N N Wulandari, H Rustamaji, W U Fibarzy, T Prakoso, J Rizkiana, H Devianto, P Widiatmoko, I Nurdin</i>	
Wettability improvement of carbon nanotube for supercapacitor electrode.....	30
<i>H Devianto, N Luthfiana, P Widiatmoko, I Nurdin, T Prakoso</i>	
Effective Deagglomeration in Biosynthesized Nanoparticles: A Mini Review.....	38
<i>S Khairunnisa, V Wonoputri, T W Samadhi</i>	
Effects of Fe-Doped Electrolyte and Feed Flow Rate Evaluation in Home Made Solid Oxide Fuel Cell	48
<i>Hary Devianto, Isdiriyani Nurdin, Pramujo Widiatmoko, Kafi Adi Prasetya, Basil Pradipta</i>	
Techno-economic and Environmental Analyses on Reduced Graphene Oxide modified Kapok Fiber as Oil Absorbent.....	55
<i>Graecia Lugito, Tjokorde Walmiki Samadhi, Tirto Prakoso, Muhammad Lauda, Vincent Laurent Tanujaya</i>	
Lipase immobilization onto Cellulose Nanocrystals (CNC) for catalyzing lipolysis of triglycerides.....	62
<i>Elvi Restiawaty, Fauzatu Arabica Yatasya, Ellys, Neng Tresna Umi Culsum, Akhmaloka, Yogi Wibisono Budhi</i>	
Utilization of Kaolin as a Filling Material for Rubber Solid Tire Compounds for Two-wheeled Electric Scooters.....	68
<i>Nasruddin, Sri Agustini, Muhammad Sholeh</i>	
The effect of nanostructured silica synthesis temperature on the characteristics of silica filled natural rubber composite	78
<i>Muhammad Sholeh, Rochmadi Rochmadi, Hary Sulisty, Budhijanto Budhijanto, Martin Doloksaribu</i>	
Numerical Investigation of Double Chamber Acetate-Fed Microbial Fuel Cell in Unsteady-State Condition.....	88
<i>I Subadri, A Satriyatama, I D M Budi, A Harimawan</i>	

Evaluation of Heat Distribution And Aeration On Xylanase Production From Oil Palm Empty Fruit Bunches Using Tray Bioreactor	96
<i>Diah Meilany, M T A P Kresnowati, Tjandra Setiadi</i>	
Syngas fermentation for production of ethanol	106
<i>N A Istiqomah, M T A P Kresnowati, T Setiadi</i>	
Phenolic Compound, Antioxidant and Antibacterial properties of Electrospun PVP Nanofiber loaded with <i>Bassella rubra</i> linn extract and Alginate from <i>Sargassum</i> sp.	115
<i>Eka Lutfi Septiani, Okky Putri Prastuti, Siti Machmudah, Sugeng Winardi, Wahyudiono, Hideki Kanda, Motonobu Goto</i>	
Estimation of the biomass yield and stoichiometric coefficient during bioproduct formation through thermodynamic approach: a case study of biosurfactant production	122
<i>R S Adiandri, R Purwadi, Hoerudin, T Setiadi</i>	
Cultivation of ‘ <i>Botryococcus Braunii</i> ’ Microalgae for Hydrocarbons Production and CO ₂ Bio-fixation	134
<i>R G Dewi, D Srikaton, S Sitorus, G N Sevie, P Bunga, S Permata</i>	
Modelling and Simulation of Biobutanol Fermentation by <i>Clostridium saccharoperbutylacetonicum</i> N1-4.....	143
<i>Elvi Restiawaty, Ardiyan Harimawan, Novaldio Rizki, Fauz Irfan Rafi</i>	
Medium Optimization for Production of <i>Monascus purpureus</i> Pigment through Solid-state Fermentation.....	153
<i>G A Ismail, A D Fitriana, U Sukandar</i>	
Study of the Effect of Glycerol Plasticizer on the Properties of PLA/Wheat Bran Polymer Blends.....	160
<i>A Satriyatama, V A A Rochman, R E Adhi</i>	
Catalytic Process Development of Bio-BTX from Lignocellulose Derived Product: Preliminary Study Using Transition Metal Catalysts	166
<i>Haryo Pandu Winoto, C B Rasrendra, Jenny Rizkiana, Johannes Kurniawan Leo, Andre Citawijaya</i>	
Estimation of Xylose Recovery from Lignocellulosic Biomass.....	175
<i>M T A P Kresnowati, D C Januardi, S V Utomo</i>	
A Study of Producing Natural Red Color on Ikat Weaving Threads.....	185
<i>D P Dala Ngapa, Y Daud, A C Sabuna</i>	
Identification of Biomordant in Merbaun Village, West Amarasi District, Kupang Regency	191
<i>A K Taimenas, J Ngginak, A C Sabuna</i>	
Cost-Benefit Analysis of Palm Kernel Shells as a Diesel Fuel Substitution for Hot-Mixed Asphalt.....	198
<i>Evi Gravitationi, Nuri Resti Chayyani, Sunu Herwi Pranolo, Prabang Setyono, Ary Setyawan</i>	
Cogasification performance of deashed coal with various biomass	207
<i>Jenny Rizkiana, Sandy Fajar Maulana, Ghiffary Azka Nur Aulia, Nasywa Kamilah, Reyhan Fitri Ananda, Naafi Fauzan Mahendraputra Sastrohutomo, Edo Muhammad Nashirudin Latif, Winny Wulandari, Dwiwahju Sasongko</i>	
Mass Balance analysis of Bioethanol Production from Sweet Sorghum (<i>Sorghum bicolor</i>)	217
<i>Muhammad Lauda, Nadiya Rahmawati, Wayda Rahma Putri Fajar, Aliya Ramadhani, Rahmah Amirah June, Meiti Pratiwi, Jenny Rizkiana</i>	

Mini solar water heating biodiesel plant by homogeneous catalyzing	228
<i>Rinjani Ratih Rakasiwi, Syaifurrahman, Usman A Gani</i>	
Process Modeling of Drying and Torrefaction of Oil Palm Trunk (OPT).....	234
<i>Dendy Adityawarman, Vika Fujiyama, Hyung Woo Lee, Retno Gumilang Dewi, Johnner P. Sitompul</i>	
Novel Approach of Biodiesel Production Waste Utilization to Support Circular Economy in Biodiesel Industry.....	241
<i>Aghietyas Choirun Az Zahra, Ilya Arina Rusyda, Andini Hizbiyati, Felix Giovani, Nabila Zahara, Bramantha Jiwandaru, David Gunawan, Giovani Andre Halim, Meiti Pratiwi, Astri Nur Istiyami, Atmy Verani Rouly Sihombing, Ardiyan Harimawan, Dwiwahju Sasongko, Jenny Rizkiana</i>	
The potential of Biogas in Energy Transition in Indonesia	251
<i>Elisabeth Rianawati, Saut Sagala, Ichsan Hafiz, Johannes Anhorn, Sinshaw Alemu, Jorge Hilbert, Dwight Rosslee, Mutala Mohammed, Yaseen Salie, Dominik Rutz, Michael Rohrer, Angela Sainz, Franz Kirchmeyr, Aleksejs Zacepins, Frank Hofmann</i>	
Biogas Utilization in KPBS Pangalengan: History and Challenges	260
<i>Pramujo Widiatmoko, Jenny Rizkiana, Susilo Yuwono, Mohammad Taufiq, Candra Purnama Hadi</i>	
Economic and Life Cycle Assessments of Integrating Gasification Unit into Production Unit of Pellet from Fallen Leaves and Twig.....	268
<i>Fadil Abdul Rahman, Gendewa Utomo, Indra Purwadi, Herri Susanto</i>	
Food Safety Analysis and Improvement Concept of β -Carotene Extraction from Fungal Fermented Palm Oil Empty Fruit Bunches (EFB); Extraction Method and Solvent Selection	277
<i>Syahdan Amir Muhammad, Clara Novia, Achmad Qodim Syafaatullah</i>	
Interesterification of Indonesian Vegetables Oil for Cocoa Butter Alternatives: Its Effect on Slip Melting Point Changes	287
<i>Dianika Lestari, Nathania, Oktalia Putri Pratama, Jenny Rizkiana</i>	
Statistical Mixture Design for Modelling and Optimization of Feed Mixture in the Chemical Interesterification to produce Cocoa Butter Alternatives	297
<i>Jenny Rizkiana, Nathania, Oktalia Putri Pratama, Dianika Lestari</i>	
Pediocin and Grape Seed Extract as Antimicrobial Agents in Nanocellulose Biobased Food Packaging: A Review	306
<i>Timotius Weslie, Vincent Felixius, Zulfah Amala, Dian Shofinita</i>	
Taro Ice Cream: Addition of Colocasia esculenta Stem to Improve Antioxidant Activity in Ice Cream	315
<i>A H Asaduddin, U N Maulani, A Y Sari, K Hawari, A A Ayusari</i>	
Production of Coconut Oil and Protein for Food and Cosmetic Ingredients	321
<i>Dianika Lestari, Amilah Ridho Rahmani, Danu Ariono</i>	
Preliminary Evaluation of Halal Protein Hydrolysate Production in Indonesia	328
<i>Made Tri Ari Penia Kresnowati, Cantika Rahayu Affandi, Cindi Pratiwi</i>	
Techno-economic Analysis: Antioxidant-Rich Natural Colorant Production from Dragon Fruit Peel	337
<i>D Shofinita, Y Bindar, R U Dinnita, F Rizqi</i>	

Fermented cassava as an alternative flour for pasta noodle.....	347
<i>R Purwadi, C F Teguh, D Mazaya</i>	
The effect of size and solid content in hydrolysis of sweet potato starch using endogenous beta-amylase enzyme	352
<i>R Purwadi, D Lestari, C A Lohoo, J L Tirtaadi</i>	
Cradle to Gate Life Cycle Assessment of Palm Oil Industry	357
<i>Ahmadi, Mahidin, M Faisal, Hamdani, K Siregar, Erdiwansyah, R Masturah, Nasrullah</i>	
Techno-Enviro-Economic Study of Hydrogenated Vegetable Oil Production from Crude Palm Oil and Renewable Hydrogen.....	366
<i>A H Vivadinar, W W Purwanto</i>	
Multi-Objective Optimization of Blending Strategy of FAME, HVO, and Petroleum Diesel	376
<i>Shanti Mustika, Widodo Wahyu Purwanto</i>	
Simulation of CO ₂ Capture Process for Coal based Power Plant in South Sumatra Indonesia	386
<i>M. Eviani, H. Devianto, P. Widiatmoko, I. F. Sukmana, H R Fitri, F. Yusupandi</i>	
Plastic marine debris study based on Indonesian plastic national balance (IPNB) and seashore approach	395
<i>A Z Abidin, S Steven</i>	
Study on Indonesian plastic marine debris based on river survey	403
<i>A Z Abidin, S Steven</i>	
Energy and Exergy Analysis on the Rotary Kiln Unit of RKC-2 PT. Semen Gresik – Tuban Plant.....	411
<i>Mala Hayati Nasution, Irwan Rasyid Syahputra, Darul Rahman</i>	
Circular Economy on Organic Waste Management with MASARO Technology	419
<i>A Z Abidin, H Bramantyo, M K Baroroh, C Egiyawati</i>	
Circular Economy on Non-Biodegradable Waste Management with MASARO Technology.....	427
<i>A Z Abidin, E V Yemensia, K W Wijaya, A P Rahardjo</i>	
Integrated Biorefinery Technology: Monetization of Oil Palm Empty Fruit Bunch to Biofuel & Bio-based Chemicals, and Beyond.....	438
<i>Rina Mariyana, Azka Azkiya Choliq, Kharis Adi Rahmanto, Yusuf Nugroho, Ronny Purwadi, MTAP Kresnowati, Krisna Septiningrum, B.M. Dabukke Frans</i>	
Microplastic pollution in Surabaya River Water and Aquatic Biota, Indonesia.....	447
<i>P Lestari, Y Trihadiningrum, M Firdaus, I D A A Warmadewanthi</i>	
Microwave-Assisted Synthesis of TiO ₂ /GO Composite and Its Adsorption-Photocatalysis Property under Visible Light.....	460
<i>S Setiawan, A Hardiansyah, C W Kartikowati, A F Arif, S Priatmoko, O Arutanti</i>	
Non-Solvent Selection for Cellulose Acetate/Polyethylene Glycol/Polyethylene Glycol-grafting-Graphene Oxide Membranes	470
<i>A Ramadhani, R D Nyamiati, I Berin, N A Murtadho, Y Rahmawati, S Nurkhamidah</i>	
Effect of Additive on Microstructure, Hydrophilicity and Ultrafiltration Performance of Polyethylene Terephthalate Membranes.....	480
<i>Samuel P. Kusumocahyo, Syarifa K. Ambani, Shelly Marceline, Franzesca Michelle</i>	

Separation of Potassium from The Model Solution.....	489
<i>Ratna Puspita, Herri Susanto</i>	
Effect of Graphene Oxide on the Performance of Cellulose Acetate/ Polyethylene Glycol Membrane with Blending Method for Desalination of Brackish Water.....	495
<i>R D Nyamiati, B C Devi, B A Febriansyah, A Ramadhani, Y Rahmawati, S Nurkhamidah</i>	
Progress, Challenges, and Prospects of Forward Osmosis (FO) and Pressure Retarded Osmosis (PRO) as An Alternative solution for Water and Energy Crisis.....	503
<i>Graecia Lugito, Danu Ariono, Mochamad Rizqy Trihutama Putra, Zoealya Nabilla Zafra</i>	
Regeneration of Spent Bleaching Earth for PLA Nanocomposite Filler.....	514
<i>Hizkia M V Gultom, Tika Paramitha, Johnner P Sitompul</i>	
Purification of vitamin E from palm fatty acid distillate through neutralization, extraction, and adsorption methods.....	524
<i>Anggita Veningtia Sari, Ardiyan Harimawan, Dianika Lestari</i>	
Effect of Dimethyl Sulfoxide (DMSO) as a Green Solvent and the Addition of Polyethylene Glycol (PEG) in Cellulose Acetate/Polybutylene Succinate (CA/PBS) Membrane's Performance	530
<i>R D Nyamiati, Y Rahmawati, A Altway, S Nurkhamidah</i>	
Natural Gas Network Design using Superstructure Method in East Java Indonesia	541
<i>Rendra Panca Anugraha, Renanto, Juwari</i>	
Isomerization of Raw Turpentine Using Various Combination of Strong and Weak Acid Catalyst for Eucalyptol Production.....	548
<i>Nicolaus Elka Yudhatama, Diva Almira Chairany, Muhammad Mufti Azis, Antonius Indarto</i>	
Depolymerization Kinetics of Aqueous Cassava Starch under Sonication Process using Free- Radical Depolymerization Model and its Correlation with Radical Production from Acoustic Cavitation	555
<i>Bramantyo Airlangga, A Dewangga Widyanindra, A Ahmad Adnan Billah, Prida Novarita Trisanti, Juwari, Sumarno</i>	
Kinetic studies and performance analysis of Indonesian rice husk pyrolysis.....	566
<i>L D Kasmiarno, S Steven, J Rizkiana, E Restiawaty, Y Bindar</i>	
Isomerization of Raw Turpentine for Cineole using Response Surface Methodology (RSM) : Influence of Acid Ratios and Residence Time	576
<i>Divia Almira Chairany, Nicolaus Elka Yudhatama, Muhammad Mufti Azis, Antonius Indarto</i>	
Effects of Operating Conditions on the Production of Sodium Stearoyl 2- Lactylate.....	583
<i>L Handojo, D Shofinita, K Yuventia, Lindawaty</i>	
Application of Reverse Flow Reactor for Vent Gas Emission Reduction in Catalytic Oxidation Unit at Purified Terephthalic Acid Plant	591
<i>F M Hanafiah, Y W Budhi</i>	
Synthesis of Maleic-Modified Rosin Ester from Pine Rosin.....	602
<i>Tirto Prakoso, Ihda Kumalasari, Bramantha Jiwandaru, Tatang Hernas Soerawidjaja, Muhammad Mufti Azis, Antonius Indarto</i>	
Activity Test of CuO/ γ -Al ₂ O ₃ as Catalyst of Methanol Dehydration to Dimethyl Ether at Atmospheric Pressure.....	608
<i>Edi Susanto, Aisyah Ardy, Herri Susanto</i>	

Titania Modified Silica from Sugarcane Bagasse Waste for Photocatalytic Wastewater Treatment	613
<i>Wibawa Hendra Saputera, Candra Egiyawati, Amellia Setyani Putri, Aryan Fathoni Amri, Jenny Rizkiana, Dwiwahju Sasongko</i>	
Optimization of UV light source conditions for photocatalytic activity of methyl orange using TiO ₂	621
<i>S O Sativa, M A Zulfikar, A Alni</i>	
Improved Visible Light Activity of Copper Oxide/Carbon Nitride Photocatalysts Prepared by Photodeposition for Phenol Degradation.....	627
<i>C P Sagita, L Yuliati</i>	
High photocatalytic activity of zinc metatitanate materials for phenol photodegradation.....	638
<i>K T A Priyanga, Y S Kurniawan, L Yuliati</i>	
TiO ₂ /AC Composites for Adsorption-Photocatalytic of Methyl Orange.....	648
<i>C W Kartikowati, A L Wulansari, B Poerwadi, Supriyono, A F Arif, T Sulistyaningsih, O Arutanti</i>	

Author Index