

# **3rd Materials Research Society of Indonesia Meeting (MRS-Id 2018)**

**Materials for Energy and Environment  
Sustainability**

IOP Conference Series: Materials Science and Engineering  
Volume 622

Bali, Indonesia  
31 July - 2 August 2018

## **Editors:**

**Khairurrijal Khairurrijal  
Rino R. Mukti  
Hutomo Suryo Wasisto**

**Ariando  
Satria Z. Bisri**

ISBN: 978-1-7138-0902-9  
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. (2020)

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](mailto: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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

<p>THE PROPERTIES OF BOLUS MATERIAL USING SILICONE RUBBER ..... 1</p> <p style="padding-left: 20px;"><i>Heri Sutanto, Indras Marhaendrajaya, Gede Wiratma Jaya, Eko Hidayanto, Astri Suppa Supratman, Santi Yuli Astuti, Tris Budiono, Muhammad Agus Firmansyah</i></p>	1
<p>EFFECT POLYETHYLENE GLYCOL (PEG 400) TO THE PHYSICAL PROPERTIES OF GADOLINIUM DOPED CERIUM (CE<sub>0.9</sub> GD<sub>0.1</sub> O<sub>1.95</sub>) NANOPARTICLES SYNTHESIZED BY CO-PRECIPIATION METHOD ..... 7</p> <p style="padding-left: 20px;"><i>Damisih, J. Raharjo, H. Yuliani, A.U. Hapsari, Masmui, R.D. Pravitasari, Grandevi</i></p>	7
<p>METAMATERIAL ANTENNA ON ELECTRO-OPTIC MODULATOR FOR WIRELESS TERRA-HERTZ DETECTION THROUGH RADIO-OVER-FIBRE TECHNOLOGY ..... 20</p> <p style="padding-left: 20px;"><i>Yusuf Nur Wijayanto, Ashif Aminulloh Fathnan, Atsushi Kanno, Dadin Mahmudin, Pamungkas Daud</i></p>	20
<p>ANTIMICROBIAL HOLLOW FIBER POLYPROPYLENE/ZNO MEMBRANE FOR EFFECTIVE AIR FILTRATION ..... 30</p> <p style="padding-left: 20px;"><i>Anak Agung Istri Agung Sri Komaladewi, K. Khoiruddin, I Dewa Gede Ary Subagia, Dea Indriani Astuti, I Gede Wenten</i></p>	30
<p>EVALUATION WETTABILITY OF NANOFLUID ON THE SURFACE OF ZIRCALLOY 4 BEFORE AND AFTER OXIDATION ..... 36</p> <p style="padding-left: 20px;"><i>Djoko Hadi Prajitno, Very Trisnawan, Jupiter Pane Sitorus</i></p>	36
<p>RGO BASED PHOTO-ANODE IN DYE-SENSITIZED SOLAR CELLS (DSSC) AND ITS PHOTOVOLTAIC CHARACTERISTICS ..... 43</p> <p style="padding-left: 20px;"><i>Waode Sukmawati Arsyad, Aricia Pristianti, La Agus, Rahmat Hidayat</i></p>	43
<p>EFFECT OF SODIUM DODECYLBENZENE SULFONATE AS ANIONIC SURFACTANT ON WATER BASED CARBON NANOFLUID PERFORMANCE AS QUENCH MEDIUM IN HEAT TREATMENT ..... 52</p> <p style="padding-left: 20px;"><i>L Oktavio, C A Ramadhani, D Rakhman, S Harjanto, W N Putra</i></p>	52
<p>DRIED NATA DE COCO FOR EXTEND THE SHELF LIFE OF FRUITS ..... 58</p> <p style="padding-left: 20px;"><i>H. D. Rahmayanti, N. Amalia, E. Yuliza, E. Sustini, M. Abdullah</i></p>	58
<p>SYNTHESIS AND CHARACTERIZATION OF GADOLINIUM DOPED CERIUM (CE<sub>0.9</sub> GD<sub>0.1</sub> O<sub>1.95</sub>) BY USING VARIOUS CARBONATES AS A PRECIPITANT ..... 63</p> <p style="padding-left: 20px;"><i>Ade Utami Hapsari, Jarot Raharjo, Hanif Yuliani, I.G. Agung Suradharmika, Damisih, Retna Deca Pravitasari, Desiana P. Sari</i></p>	63
<p>EFFECT OF PARTICLE SIZE DISTRIBUTION ON THE PREPARATION OF BONDED NDFEB PERMANENT MAGNET ..... 70</p> <p style="padding-left: 20px;"><i>C. Kurniawan, S. Wahyuni, Ramlan, E. A. Setiadi, P. Sebayang</i></p>	70
<p>SYNTHESIS OF MAGNETITE NANOPARTICLES VIA CO-PRECIPIATION METHOD ..... 76</p> <p style="padding-left: 20px;"><i>Ahmad Fadli, Komalasari, Arisman Adnan, Iwantono, Rahimah, Adela Shofia Addabsi</i></p>	76
<p>THE ROLE OF NANO-SIC ON CHARACTERISTICS OF MG-AL-SR/NANO-SIC COMPOSITES PRODUCED BY STIR CASTING ROUTE ..... 82</p> <p style="padding-left: 20px;"><i>Vioni Dwi Sartika, Anne Zulfia Syahril</i></p>	82

MOLECULAR DYNAMICS SIMULATION OF PLATINUM FILM GROWTH BASED ON THERMAL EVAPORATION METHOD .....	89
<i>Rinaldo Marimpul, Toto Winata, Fatimah Arofiati Noor, Ibnu Syuhada, Ahmad Rosikhin</i>	
POLYETHYLENE GLYCOL ADDITION AS NON-IONIC SURFACTANT IN WATER-BASED CARBON MICROFLUID FOR QUENCH MEDIUM IN HEAT TREATMENT PROCESS .....	94
<i>D. Rakhman, W. N. Putra, C. A. Ramadhani, S. Harjanto</i>	
A COMPARATIVE STUDY ON COMMERCIAL GRADE AND LABORATORY GRADE OF TIO <sub>2</sub> PARTICLE IN NANOFLUID FOR QUENCH MEDIUM IN RAPID QUENCHING PROCESS.....	99
<i>C.A Ramadhani, W.N. Putra, D. Rakhman, L. Oktavio, S. Harjanto</i>	
10 GHZ OPTICAL MODULATOR USING CPS STRUCTURE FOR COMMUNICATION AND SENSING .....	106
<i>P. Daud, D.P. Kurniadi, D. Mahmudin, Y.N. Wijayanto, P. Putranto, E.J. Pristiano, A. Nurrahman, Andriana, Zulkarnaen, O. Vertus</i>	
POLYETHERIMIDE NANOFILTRATION MEMBRANES MODIFIED BY INTERFACIAL POLYMERIZATION FOR TREATMENT OF TEXTILE DYES WASTEWATER.....	113
<i>Gabriel Febrianto, Doni Karisma, Dave Mangindaan</i>	
THE EFFECT OF MANGANESE PALMITATE AS PRO-OXIDANT ADDITIVE ON MECHANICAL PROPERTIES OF POLYPROPYLENE.....	120
<i>Reza Jati Pamungkas, Rachmawati, I Made Arcana</i>	
COMPARISON OF TENSILE STRENGTH OF CONTINUES-CORE METHOD AND 4 STRAND MODIFIES METHOD OF AFTER HEALING OF REPAIRED KESSLER RABBIT'S ACHILLES TENDON INJURY .....	125
<i>P S Caksana, IKS Kawiyana, I W S Dusak, T G T Nindhia</i>	
ON THE APPLICATION OF DIFFUSION MAGNETIC RESONANCE IMAGING FOR STUDY OF AGAROSE .....	129
<i>Yanurita Dwihapsari, Salma Niatu Zakiah, Darminto</i>	
RECENT DEVELOPMENT OF LACTIC ACID PRODUCTION USING MEMBRANE BIOREACTORS .....	133
<i>L. Aliwarga, A.K. Wardani, P.T.P. Aryanti, I G. Wenten</i>	
SIMULATION OF FEED MODULATION ON DYNAMIC FIXED-BED REACTOR FOR CO METHANATION OVER NI-BASED CATALYST .....	143
<i>Utari Nuravifah, Sarah Eka Putri, Yogi Wibisono, Budhi, Jenny Rizkiana</i>	
IONIC LIQUIDS (ILS)-BASED ELECTROLYTES SYSTEM FOR LITHIUM ION BATTERIES .....	154
<i>Astrid. O. Nandika, Achmad Rochliadi, Aep Patah</i>	
EFFECT OF ELECTROPLATING CURRENT ON SURFACE MORPHOLOGY AND THICKNESS OF PLATED-THROUGH HOLE (PTH) IN MULTILAYER PRINTED CIRCUIT BOARD (PCB).....	161
<i>Muhammad Arifin, Kamarudin, Vivin Octowinandi, Riki Ria</i>	
SPIN CURRENT GENERATION IN ONE – DIMENSION SPIN – CHAIN MODEL OF INSULATING MAGNETIC INTERFACE .....	166
<i>Adam B. Cahaya, M. A. Majidi</i>	
THE POROSITY AND HARDNESS OF FE-18AL ALLOY ADDED ZRO <sub>2</sub> NANOPARTICLES.....	171
<i>P. Pawawoi, D.H. Prjitno, R. Adhitya, A. Manaf</i>	

THE ION TRANSPORT CHARACTERISTICS OF CHITOSAN COMPOSITE MEMBRANES 'CH-AGNP' WITH EMPHASIS ON THE AMOUNT OF FILLER .....	178
<i>Ni Nyoman Rupiasih, W. G. Suharta, Made Sumadiyasa, I Ketut Putra, Ni Made Ayu Mega Trisnayani Putri</i>	
CHARACTERISTICS OF CORNCOB-ORIGINATED ACTIVATED CARBON USING TWO DIFFERENT CHEMICAL AGENT .....	185
<i>Nur Aini Rahma, Asih Kurniasari, Yoyok Dwi Setyo Pambudi, His Muhammad Bintang, Anne Zulfia, Chairul Hudaya</i>	
THE EFFECT OF TEMPERATURE AND REACTION TIME ON THE SHAPE OF AG NANOWIRES SYNTHESIZED USING THE POLYOL METHOD .....	192
<i>Fairuz Septiningrum, Liszulfah Roza, Vivi Fauzia</i>	
OPTIMIZATION OF FABRICATING FLUORINE-DOPED TIN OXIDE BY USING SPRAY PYROLYSIS METHODS .....	200
<i>S Saehana, Darsikin, Z Arifin, Nasar</i>	
INFLUENCE OF INORGANIC BINDER COMPOSITION ON THE STRUCTURE-PROPERTY RELATIONSHIP OF MONOLITHIC DYE-SENSITIZED SOLAR CELLS WITH CARBON- BASED COUNTER ELECTRODE .....	206
<i>N M Nursam, Shobih, E S Rosa, J Hidayat, Z Mubarak</i>	
SYNTHESIS OF GEOPOLYMER FROM BLENDS OF TROPICAL BIOMASS ASHES .....	214
<i>Tjokorde Walmiki Samadhi, Winny Wulandari, Afiana Suroto, Dendi Satriya Agung</i>	

**Author Index**