

1st International Conference on Functional and Engineering Materials (FEM 2019)

IOP Conference Series: Materials Science and Engineering
Volume 743

Lodz, Poland
16 - 18 October 2019

ISBN: 978-1-7138-3498-4
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. (2021)

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

<p>SUPPRESSION OF (CU,NI)₆SN₅ INTERMETALLIC COMPOUND IN SN-0.7CU-0.05NI+1WT.TIO₂ SOLDER PASTE COMPOSITE SUBJECTED TO ISOTHERMAL AGING.....</p> <p style="padding-left: 20px;"><i>R Mohd Said, N Saud, MAA Mohd Salleh, M N Derman</i></p>	1
<p>IN VITRO BIOACTIVITY STUDY OF THERMOPLASTIC STARCH/BENTONITE/HYDROXYAPATITE COMPOSITES FOR BIOMEDICAL APPLICATIONS.....</p> <p style="padding-left: 20px;"><i>Nurul Husna Zakaria, Noorhafiza Muhammad, Mohd Mustafa Al Bakri Abdullah, S N F M Noor</i></p>	8
<p>EFFECT OF HALOGEN FREE-FLAME RETARDANTS ON THE MECHANICAL AND MORPHOLOGICAL PROPERTIES OF KENAF/POLYURETHANE FOAM COMPOSITES.....</p> <p style="padding-left: 20px;"><i>Nur Suhaili Mohd Soberi, R Rozyanty, Firuz Zainuddin, Hazim Mohamad Amini</i></p>	16
<p>CORROSION RESISTANCE OF MICRO-TEXTURED SURFACE MODIFIED ALUMINA-TITANIA COATING.....</p> <p style="padding-left: 20px;"><i>J. A. Wahab, M. J. Ghazali, M. N. Derman</i></p>	22
<p>COMPRESSIVE STRENGTH AND THERMAL CONDUCTIVITY OF METAKAOLIN GEOPOLYMERS WITH ANISOTROPIC INSULATIONS.....</p> <p style="padding-left: 20px;"><i>Nur Ain Jaya, Liew Yun-Ming, Mohd Mustafa Al Bakri Abdullah, Kamarudin Hussin, Heah Cheng Yong, Ridho Bayuaji, Muhammad Faheem Mohd Tahir</i></p>	30
<p>EFFECT OF SOLID-TO-LIQUID RATIO ON THIN FLY ASH GEOPOLYMER.....</p> <p style="padding-left: 20px;"><i>Ng Yong-Sing, Liew Yun-Ming, Mohd Mustafa Al Bakri Abdullah, Ng Hui-Teng, Kamarudin Hussin, Heah Cheng Yong, Nurul Aida Mohd Mortar, Andrei Victor Sandu</i></p>	36
<p>THE EFFECT OF POLYETHYLENE GLYCOL (PEG) ON TIO₂ THIN FILMS VIA SOL-GEL METHOD.....</p> <p style="padding-left: 20px;"><i>D S Che Halin, K A Razak, N S Mohamad Sukeri, A Azani, M M A B Abdullah, M A A M Salleh, N Mahmed, M M Ramli, AW Azhari, V Chobpattana</i></p>	43
<p>INFLUENCE OF DIFFERENT MATERIALS ON THE MECHANICAL ASPECTS IN THE DESIGN OF CYCLONE GASIFIER.....</p> <p style="padding-left: 20px;"><i>C. Y. Khor, M. A. M. Nawi, Muhammad Ikman Ishak, Z. X. Wei, M. U. Rosli</i></p>	49
<p>EXPERIMENTAL AND COMPUTATIONAL EVALUATIONS OF THE MECHANICAL STRESSES OF BANANA TRUNK FIBRE-REINFORCED EPOXY RESIN COMPOSITE IN COFFEE TABLE APPLICATION.....</p> <p style="padding-left: 20px;"><i>Muhammad Ikman Ishak, M U Rosli, C Y Khor, C N Ismail, M A M Nawi</i></p>	54
<p>A NOVEL GREEN TECHNOLOGY KAFFIR LIME EXTRACT AS LIZARD REPELLENT.....</p> <p style="padding-left: 20px;"><i>M. A. M. Nawi, Muhammad Ikman Ishak, M. U. Rosli, M. A. R. M. Ayub, C. Y. Khor, Siti Nor Azreen Ahmad Termizi, Noorhidayah Ishak</i></p>	59
<p>SIMULATION-BASED OPTIMIZATION OF PLASTIC INJECTION MOLDING PARAMETER FOR AUTOMOTIVE CAR WHEEL FABRICATION USING RESPONSE SURFACE METHODOLOGY (RSM).....</p> <p style="padding-left: 20px;"><i>M. U. Rosli, C. Y. Khor, M. A. M. Nawi, Haris Ismail, Muhammad Ikman Ishak</i></p>	65

PARAFFIN AS A PHASE CHANGE MATERIAL IN CONCRETE FOR ENHANCING THERMAL ENERGY STORAGE	71
<i>Rafiza Abd Razak, Adeline Choo Khang Zhe, Mohd Mustafa Al Bakri Abdullah, Zarina Yahya, Subaer Junaidi, Khairunnisa Muhamad, Nurul Aida Mohd Mortar</i>	
SEAWATER EXPOSURE EFFECT ON FLY ASH BASED GEOPOLYMER CONCRETE WITH INCLUSION OF STEEL FIBER	77
<i>Zarina Yahya, Mohd Mustafa Al Bakri Abdullah, Leow Yee Jing, Long-Yuan Li, Rafiza Abd Razak</i>	
SYNTHESIS AND CHARACTERIZATION OF FLY ASH BASED GEOPOLYMER CERAMICS: EFFECT OF NAOH CONCENTRATION	86
<i>Romisuhani Ahmad, Wan Mastura Wan Ibrahim, Mohd Mustafa Al Bakri Abdullah, Andrei Victor Sandu, Nurul Aida Mohd Mortar, Noratikah Hashim, Warid Wazien Ahmad Zailani</i>	
PROPERTIES OF BLENDED ALKALINE SYSTEM GEOPOLYMER- A REVIEW	93
<i>Fakhryna Hannanee Ahmad Zaidi, Romisuhani Ahmad, Zarina Yahya, Muhammad Faheem Mohd Tahir, Wan Mastura Wan Ibrahim, Ahmad Syauqi Saufi</i>	
SPECTROPHOTOMETRIC ANALYSIS ASSAY FOR THE MEASUREMENT OF ARSENIC USING NANOCOMPOSITE OF SILICA AND GRAPHENE	97
<i>M. N. A. Uda, Uda Hashim, C. B. Subash Gopinath, M. N. Afnan Uda, N. A. Parmin, Hussain Adam, Nur Hulwani Ibrahim</i>	
ANALYSIS ON GOLD NANOROD INTERDIGITATED ELECTRODE SENSOR USING SIMPLE PHOTOLITHOGRAPHIC PROCESS	103
<i>Hussaini Adam, C. B. Subash Gopinath, M. N. A. Uda, Uda Hashim, Tijjani Adam, M. N. Afnan Uda</i>	
NEW DEVELOPMENT QUANTIFICATION METHODS FOR SALT IODINE AND URINARY IODINE USING MICROFLUIDICS BASED NANOTECHNOLOGY	109
<i>Nur Hulwani Ibrahim, M. N. Salimi, M. N. A. Uda, N. A. Parmin, Uda Hashim, M. N. Afnan Uda</i>	
DEVELOPMENT OF VOLTAGE AMPLIFIER ELECTRONIC READER FOR MULTIPLEX DETECTION OF TWO ELECTRODE ELECTRICAL BIOSENSORS	115
<i>M. N. Afnan Uda, Asral Bahari Jambek, U. Hashim, M. N. A. Uda</i>	
DEVELOPMENT OF INTERNET OF THINGS (IOT) BASED ELECTRONIC READER FOR MEDICAL DIAGNOSTIC SYSTEM	124
<i>M. N. Afnan Uda, Asral Bahari Jambek, U Hashim, M. N. A. Uda, M. A. F. Bahrin</i>	
NANO-MICRO-MILI CURRENT TO MILI VOLTAGE AMPLIFIER FOR AMPEROMETRIC ELECTRICAL BIOSENSORS	133
<i>M. N. Afnan Uda, N. A. Parmin, Asral Bahari Jambek, U. Hashim, M. N. A. Uda, S. N. A. Shahrudin, Hussaini Adam</i>	
ELECTRICAL DNA BIOSENSOR USING ALUMINIUM INTERDIGITATED ELECTRODE FOR SALMONELLA DETECTION	141
<i>M. N. Afnan Uda, Asral Bahari Jambek, U. Hashim, M. N. A. Uda</i>	
DEVELOPMENT OF GEOPOLYMER CERAMIC AS A POTENTIAL REINFORCING MATERIAL IN SOLDER ALLOY: SHORT REVIEW	148
<i>Nadiah 'Izzati Zulkifli, Mohd Mustafa Al Bakri Abdullah, Mohd Arif Anuar Mohd Salleh, Romisuhani Ahmad, Andrei Victor Sandu, Nurul Aida Mohd Mortar</i>	

A REVIEW OF MORPHOLOGY ANALYSIS ON DOLOMITE AS AN ADDITIVE MATERIAL IN GEOPOLYMER.....	155
<i>Ahmad Syauqi Sauffi, Wan Mastura Wan Ibrahim, Romisuhani Ahmad, Nurul Aida Mohd Mortar, Fakhryna Ahmad Zaidi, Warid Wazien Ahmad Zailani</i>	
NEW HIGH STRENGTH WATER RETAINING INTERLOCKING PAVERS BLOCK FOR HIGH MECHANICAL PERFORMING PAVEMENT AND REDUCING RUNOFF.....	161
<i>M A H Abdullah, N A Rashid, A L Abdul Rani, M F Omar</i>	
INFLUENCE OF VARIOUS SAND GRADATION ON MECHANICAL PROPERTIES AND CONCRETE QUALITY OF HIGH PERFORMANCE CONCRETE (HPC).....	168
<i>K Muhamad, N F Isa, N H Hashim, Z Tusimin, N Yahya, N A Naamandadin, R A Razak, P Y Tham</i>	
IMPROVING INDOOR ENVIRONMENTAL QUALITY (IEQ) AND COMFORTABILITY OF LECTURE ROOMS: CASE STUDY – UNICITI ALAM CAMPUS, PADANG BESAR, MALAYSIA.....	174
<i>Nurul Akmam Naamandadin, Siti Nur Aishah Mohd Noor, Norrazman Zaiha Zainol, Arita Hanim Awang, Syakir Amir Abdul Rahman, Khairunnisa Mohamad, Muhammad Naim Ahmad</i>	
MANUFACTURING OF CAST IN SITU ULTRA HIGH PERFORMANCE FIBRE REINFORCED CONCRETE (UHPRFC) - WORKABILITY, TENSILE AND COMPRESSIVE STRENGTH.....	179
<i>M. Z. A. Mohd Zahid, B. H. Abu Bakar, F. Mohamed Nazri, A. Ayob, R. Abdul Razak</i>	
MECHANICAL AND PHYSICAL PROPERTIES OF BOTTOM ASH/FLY ASH GEOPOLYMER FOR PAVEMENT BRICK APPLICATION.....	189
<i>Wan Mastura Wan Ibrahim, Mohd Mustafa Al Bakri Abdullah, Romisuhani Ahmad, Muhammad Faheem Mohd Tahir, Nurul Aida Mohd Mortar, Muhammad Amirul Aziem Noor Azli</i>	
OPTIMIZATION OF PRETREATMENT AND ENZYMATIC HYDROLYSIS OF SPENT COFFEE GROUND FOR THE PRODUCTION OF FERMENTABLE SUGAR.....	197
<i>Lai Shan Jin, Midhat Nabil Salimi, Syazni Zainul Kamal</i>	
EVALUATION AND OPTIMIZATION OF GENOMIC DNA EXTRACTION FROM FOOD SAMPLE FOR MICROFLUIDIC PURPOSE.....	207
<i>M. N. Afnan Uda, N. A. Parmin, Asral Bahari Jambek, U. Hashim, M. N. A. Uda, S. N. A. Shaharuddin</i>	
ALUMINIUM INTERDIGITATED ELECTRODE BASED BIOSENSOR FOR SPECIFIC SSDNA TARGET LISTERIA DETECTION.....	214
<i>M. N. Afnan Uda, Asral Bahari Jambek, U. Hashim, M. N. A. Uda, M. A. F. Bahrin</i>	
MECHANICAL AND RHEOLOGICAL PROPERTIES OF CONCRETE WITH CERAMIC TILE WASTE AS PARTIAL REPLACEMENT OF FINE AGGREGATE.....	221
<i>N Yahya, S M S Razak, M K Othman, S N A M Noor, K Muhamad, M K M Jaih</i>	
A CONCEPTUAL PAPER ON APPLICATION OF ENERGY EFFICIENCY MEASURES FOR REDUCING CARBON FOOTPRINT IN ZINC PHOSPHATE COATING PROCESS OF AUTOMOTIVE INDUSTRIES.....	227
<i>Abuzaar Mohd Zulkifli, Fazdliel Aswad Ibrahim, Norrazman Zaiha Zainol, Mardhiah Farhana Omar, Lim Chun Keat</i>	

PARTIALLY REPLACEMENT OF CEMENT BY SAWDUST AND FLY ASH IN LIGHTWEIGHT FOAM CONCRETE.....	235
<i>M F Omar, M A H Abdullah, N A Rashid, A L Abdul Rani</i>	
PRODUCTION OF IRON OXIDE NANOPARTICLES BY CO-PRECIPIATION METHOD WITH OPTIMIZATION STUDIES OF PROCESSING TEMPERATURE, PH AND STIRRING RATE	241
<i>Beh Hui Hui, Midhat Nabil Salimi</i>	
GLUCOSE PRODUCTION FROM SUGARCANE BAGASSE BY TWO STAGES CHEMICAL PRETREATMENT & HYDROLYSIS	254
<i>Nurul Syiffa Husna Che Roslan, Midhat Nabil Salimi</i>	
FABRICATION OF ELECTROLYTE-GATE NANOCRYSTALLINE DIAMOND- BASED FIELD EFFECT TRANSISTOR (NCD-EGFET) FOR HIV-1 TAT PROTEIN DETECTION	263
<i>Nurul Atiqah Ahmad, Ruslinda A Rahim, Nur Syakimah Ismail, Bohuslav Rezek</i>	
MECHANICAL PROPERTIES OF COCONUT SHELL REINFORCED UNSATURATED POLYESTER COMPOSITES WITH THE PRESENCE OF TITANIUM DIOXIDE AS ADDITIONAL FILLER.....	268
<i>Nurzariyah Shahidan, Mohamad Bashree Abu Bakar, Mazlan Mohamed, Azwan Mat Lazim, Ayub Ahmed Janvekar</i>	
APPLICATION OF IONIC NANO PARTICLES IN FISH PROCESSING WASTEWATER BY USING BIOCHEMICAL TREATMENT: A SHORT REVIEW	275
<i>Mohamad Anuar Kamaruddin, Lim Ewe Teik, Muhd Nazmi Ismail</i>	
FOOD WASTE QUANTIFICATION AND CHARACTERIZATION AS A MEASURE TOWARDS EFFECTIVE FOOD WASTE MANAGEMENT IN UNIVERSITY	281
<i>Mohamad Anuar Kamaruddin, Nurul Nadia Jantira, Rasyidah Alrozi</i>	
STUDY OF THE UTILIZATION OF CARBIDE WASTE AND FLY ASH ON GEOPOLYMER PASTE.....	290
<i>Ridho Bayuaji, N S Putri, Liew Yun Ming, Nurul Aida Mohd Mortar</i>	
ANALYSIS OF THE CONNECTION OF A NICKEL-CHROMIUM ALLOY WITH DENTAL CERAMICS AFTER ALUMINUM OXIDE ABRASIVE BLASTING	296
<i>W Czepulkowska, E Wołowiec-Korecka</i>	
INFLUENCE DIFFERENT AMOUNT OF CELLULOSE ON THE MECHANICAL STRENGTH OF DENTAL ACRYLIC RESIN	302
<i>Joanna Taczala, Chang Fu, Jacek Sawicki, Joanna Pietrasik</i>	
IMPACT OF NETWORK EXPANSIONS ON ENERGY LOSSES IN COMPRESSED AIR	310
<i>Karolina Perz, Aleksandra Rewolińska</i>	
AUTOMATIC SYSTEMS SUPPORTING RESEARCH ON MODERN MATERIALS AND INDUSTRIAL BONDING TECHNOLOGIES.....	317
<i>R Wojciechowski, M Bąkała, A Rylski</i>	
NUMERICAL SIMULATION OF PHASE TRANSFORMATION DURING GAS QUENCHING AFTER LOW PRESSURE CARBURIZING	326
<i>Krzysztof Krupanek, Jacek Sawicki, Victoria Buzalski</i>	
INFLUENCE OF QUENCHING TEMPERATURE OF THE INDIVIDUAL QUENCHING METHOD ON THE GEOMETRICAL DIMENSIONS OF THE ELEMENTS	335
<i>E Wołowiec-Korecka, P Zgórnjak, A Brewka, K Krupanek</i>	

THE INFLUENCE OF GRINDING WHEEL TYPE ON MICROHARDNESS AND RESIDUAL STRESSES IN VACUUM-CARBURISED 20MNCr5 STEEL USING THE SINGLE-PIECE FLOW METHOD.....	341
<i>P Zgórniak, E Wołowiec-Korecka, B Januszewicz, M Sikora, R Rosik</i>	
THE INFLUENCE OF GRINDING CONDITIONS ON SURFACE ROUGHNESS PARAMETERS OF 20MNCr5 STEEL VACUUM-CARBURISED BY SINGLE-PIECE FLOW METHOD.....	348
<i>M Sikora, P Zgórniak, E Wołowiec-Korecka</i>	
FRictional BEHAVIOUR OF TIN COATINGS GROWN BY ATOMIC LAYER DEPOSITION	355
<i>Wojciech Grodzicki, Lukasz Kolodziejczyk</i>	
COMPARISON OF MECHANICAL BEHAVIOUR OF MICROSTRUCTURES OF 2024 ALUMINIUM ALLOY CONTAINING PRECIPITATES OF DIFFERENT MORPHOLOGIES	362
<i>Anna Staszczuk, Jacek Sawicki</i>	

Author Index