IUM ENGINEERING JOURNAL

Volume 21

July 2020

Number 2



INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

ISSN: 1511-788X E-ISSN: 2289-7860 http://journals.iium.edu.my/ejournal

IIUM ENGINEERING JOURNAL

CHIEF EDITOR Ahmad Faris Ismail, IIUM, Malaysia

EXECUTIVE EDITOR AHM Zahirul Alam, IIUM, Malaysia

ASSOCIATE EDITOR Nor Farahidah Za'bah, IIUM, Malaysia

LANGUAGE EDITOR Lynn Mason, Malaysia

COPY EDITOR Hamzah Mohd. Salleh, IIUM, Malaysia

EDITORIAL BOARD MEMBERS

Abdullah Al-Mamun, IIUM, Malaysia Abdumalik Rakhimov, IIUM, Malaysia Ali Sophian, IIUM, Malaysia Erry Yulian Triblas Adesta, IIUM, Malaysia Erwin Sulaeman, IIUM, Malaysia Hanafy Omar, Saudi Arabia Hazleen Anuar, IIUM, Malaysia Konstantin Khanin, University of Toronto, Canada Ma'an Al-Khatib, IIUM, Malaysia Md Zahangir Alam, IIUM, Malaysia Meftah Hrairi, IIUM, Malaysia Mohamed B. Trabia, United States Mohammad S. Alam, Texas A&M University-Kingsville, United States Mustafizur Rahman, National University Singapore, Singapore Ossama Abdulkhalik, Michigan Technological University, United States Razi Nalim, IUPUI, Indianapolis, Indiana, United States Rosminazuin AB. Rahim, IIUM, Malaysia Waqar Asrar, IIUM, Malaysia

AIMS & SCOPE OF HUMENGINEERING JOURNAL

The **IIUM Engineering Journal**, published biannually (January and July), is a carefully refereed international publication of International Islamic University Malaysia (IIUM). Contributions of high technical merit within the span of engineering disciplines; covering the main areas of engineering: Electrical and Computer Engineering; Mechanical and Manufacturing Engineering; Automation and Mechatronics Engineering; Material and Chemical Engineering; Environmental and Civil Engineering; Biotechnology and Bioengineering; Engineering Mathematics and Physics; and Computer Science and Information Technology are considered for publication in this journal. Contributions from other areas of Engineering and Applied Science are also welcomed. The IIUM Engineering Journal publishes contributions under *Regular papers and Invited review papers*. It also welcomes contributions that address solutions to the specific challenges of the developing world, and address science and technology issues from an Islamic and multidisciplinary perspective.

REFEREES' NETWORK

All papers submitted to IIUM Engineering Journal will be subjected to a rigorous reviewing process through a worldwide network of specialized and competent referees. Each accepted paper should have at least two positive referees' assessments.

SUBMISSION OF A MANUSCRIPT

A manuscript should be submitted online to the IIUM-Engineering Journal website at http://journals.iium.edu.my/ejournal. Further correspondence on the status of the paper could be done through the journal website.

INTERNATIONAL ADVISORY COMMITTEE

A. Anwar, United States Abdul Latif Bin Ahmad, Malaysia Farzad Ismail, USM, Pulau Pinang, Malaysia Hanafy Omar, Saudi Arabia Hany Ammar, United States Idris Mohammed Bugaje, Nigeria K.B. Ramachandran, India Kunzu Abdella, Canada Luis Le Moyne, ISAT, University of Burgundy, France M Mujtaba, United Kingdom Mohamed AI-Rubei, Ireland Mohamed B Trabia, United States Syed Kamrul Islam, United States Tibor Czigany, Budapest University of Technology and Economics, Hungary Yiu-Wing Mai, The University of Sydney, Australia.

Published by:

IIUM Press,

International Islamic University Malaysia Jalan Gombak, 53100 Kuala Lumpur, Malaysia Phone (+603) 6421-5014, Fax: (+603) 6421-6298

Whilst every effort is made by the publisher and editorial board to see that no inaccurate or misleading data, opinion or statement appears in this Journal, they wish to make it clear that the data and opinions appearing in the articles and advertisement herein are the responsibility of the contributor or advertiser concerned. Accordingly, the publisher and the editorial committee accept no liability whatsoever for the consequence of any such inaccurate or misleading data, opinion or statement.



IIUM Engineering Journal ISSN: 1511-788X E-ISSN: 2289-7860

IIUM ENGINEERING JOURNAL

Volume 21, Issue 2, July 2020 https://doi.org/10.31436/iiumej.v21i2

Table of Content

EDITORIALi
CHEMICAL AND BIOTECHNOLOGY ENGINEERING
1150: THE EFFECTS OF CERIUM PROMOTER ON THE PERFORMANCE OF COBALT-BASED CATALYSTS IN FISCHER TROPSCH SYNTHESIS FOR LIQUID FUEL PRODUCTION 1 <i>Firas Khaleel Al-zuhairi, Wafaa Abdul Kadhim , Ahmed Lateef Khalaf and Mohd Hasbi Ab Rahim</i> 1203: EFFECTS OF PH, DOSAGE AND CONTACT TIME ON BORON REMOVAL FROM SYNTHETIC SALINE WATER USING <i>Moringa oleifera</i> Seeds 12 <i>Mohammed Saedi Jami, Nur Syahirah Zakaria, Moussa Mahamed Ahmed, Nik Rashida Nik Abdul Ghani, Mohammed Ngabura and Mani Malam Ahmad</i> 1207: NITROGEN AND PHOSPHORUS REMOVAL EFFICIENCY OF THREE HELOPHYTES IN CONSTRUCTED SURFACE FLOW WETLANDS FOR URBAN WASTEWATER TREATMENT 25 <i>Abdeslam Ennabili and Michel Radoux</i> 2306: ANALYSIS AND CORRELATIONS OF DIMENSIONLESS NUMBERS RELEVANT TO ORIFICES' CAVITATING FLOW 1320: BIODELIGNIFICATION OF LEMON PEELS USING <i>Aspergillus SP.</i> TO IMPROVE YIELD AND COMPOSITION OF 55 <i>Muhammad Yusuf Abduh, Enjelina Nababan, Firdanta Ginting and Jenny Juliati, Husna Nugrahapraja</i> 55 <i>Muhammad Yusuf Abduh, Enjelina Nababan, Firdanta Ginting and Jenny Juliati, Husna Nugrahapraja</i> 67
Dzun Noraini Jimat1, Intan Baizura Firda Mohamed, Azlin Suhaida Azmi1 and Azura Amid CIVIL AND ENVIRONMENTAL ENGINEERING
 1245: A COMPARATIVE STUDY ON TREATMENT TECHNOLOGIES FOR SEWAGE RECLAMATION: A FOCUS ON THE DISINFECTION PROCESS
ELECTRICAL, COMPUTER AND COMMUNICATIONS ENGINEERING
 1273: IMPROVE THE EFFICIENCY OF THE POWER TRANSMISSION SYSTEM USING THE GENETIC ALGORITHM TO DETERMINE THE OPTIMUM LOCATION AND FACTS DEVICES
MATERIALS AND MANUFACTURING ENGINEERING
1197: SPACE MAPPING OF HIP AND WRISTS MOTIONS FOR DIFFERENT TRANSFER DISTANCES IN MANUAL MATERIAL HANDLING TASK

1227: CUTTING TOOL PERFORMANCE IN TURNING OF AL 7075-T651 ALUMINIUM ALLOY 177 Nur Sofwati Daud @ Ab Aziz, Natasha A. Raof, Abdul Rahman A. Ghani, Aishah Najiah Dahne, Suhaily Mokhtar and Nor Khairusshima Muhamad Khairussaleh

1317: Investigation on influence of anionic surfactant for homogenisation of MWCNT in Aluminium 6065
MATRIX
Savina Jaddinagadhe Puttaswamy and Raghavendra Bommanahalli Venkatagiriyappa
1336: EFFECT OF SPINNING PARAMETERS ON PLA/PPC/CURCUMIN MICROFIBER DIAMETER: AN INVESTIGATION VIA
Response Surface Methodology
Sharifah Imihezri Syed Shaharuddin, Amirul Akmal Fauzan, Mohamad Faris Izzudin Mohamad Jazi,
Nur Atiqah Mohd. Akhir, Maizatulnisa Othman, Nor Khairushima Muhamad Khairussaleh,
Norhashimah Shaffiar and Zaimah Hasan
1354: DEVELOPMENT OF LOW-COST ADDITIVE MANUFACTURING SYSTEM THROUGH SELECTIVE INHIBITION SINTERING (SIS)
PROCESS AND EVALUATION OF MECHANICAL CHARACTERISTICS OF FABRICATED PARTS
Mesfin Sisay Mengesha, Balasubramanian Esakki, Arunkumar Ponnambalam,
Silambarasan Mathiyazhagan and Rajamani Devaraj
1388: PREPARATION AND CHARACTERIZATIONS OF LATEX/FILLER NANOCOMPOSITES
Mohamad Firdaus Omar, Nuriah Mohamad and Fathilah Binti Ali
1469: EFFECT OF CHITIN SOURCE AND CONTENT ON PROPERTIES OF CHITIN NANOWHISKERS FILLED POLYLACTIC ACID
COMPOSITES
Syazeven Effatin Azma Mohd Asri, Zainoha Zakaria, Azman Hassan and
Mohamad Haafiz Mohamad Kassim

MECHANICAL AND AEROSPACE ENGINEERING

 1454: CRACK INFLUENCE ON A PIPE WITH DOUBLE SLOPE UNDER INTERNAL PRESSURE: NUMERICAL SIMULATION WITH

 XFEM

 256

 Salmi Houda, Hachim Abdelilah, EL bhilat Hanan and El Had Khalid

ENGINEERING MATHEMATICS AND APPLIED SCIENCE

1456: FORMALIZATION OF THE COTTON DRYING PROCESS BASED ON HEAT AND MASS TRANSFER EQUATIONS274 Yunusova Sayyora Toshkenboyevna, Halmatov Davron Abdalimovich, Atajonov Muhiddin Odiljonovich and Huzan azarov Ulugbek Olimovich