

International Conference on Sustainable Materials (ICoSM 2020)

IOP Conference Series: Materials Science and Engineering
Volume 957

Genting Highlands, Malaysia
30 March 2020

Editors:

**Mohamed Syahmie Mohamad Rasidi
Sharifah Shahnaz Syed Bakar**

ISBN: 978-1-7138-4784-7
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

Extended Preface	
Peer review declaration	
Oxide Growth Behaviour of Fe-Ni-Cr Alloy at High Temperature Oxidation.....	1
<i>Noraziana Parimin, Esah Hamzah</i>	
Influence of Solution Treatment Temperature on the Microstructure of Ni-based HR-120 Superalloy.....	9
<i>Noraziana Parimin, Esah Hamzah</i>	
Effect of Chemical Treatment on Tensile Properties of Oil Palm Empty Fruit Bunch (OPEFB)- based All Cellulose Composite (ACC) Films.....	16
<i>Nur Liyana Izyan Zailuddin, Azlin Fazlina Osman, Rozyanty Rahman</i>	
Isolation and characterization of microcrystalline cellulose extracted from banana fiber in poly(lactic acid) biocomposite produced from solvent casting technique	24
<i>M Luqman., Tamil Arasi Vesuanathan, Mohd Nazry Salleh</i>	
Photocatalytic Behaviour of TiO ₂ -geopolymer Paste under Sunlight.....	35
<i>Siti Norsaffirah Zailan, Norsuria Mahmed, Mohd Mustafa Al Bakri Abdullah</i>	
The Effects of Epoxidised Natural Rubber (ENR-50) on Cure Characteristics and Tensile Properties of Recycled Natural Rubber Catheter Filled Ethylene Propylene Diene Monomer (EPDM) Vulcanizates.....	43
<i>Muhammad Salihin Zakaria, Nik Noriman Zulkepli, Razif Muhammed Nordin, Khairul Anwar Abdul Halim, Hafizuddin Hanafi</i>	
Structural, electronic and thermoelectric properties of SrTiO ₃ ceramic doped by lanthanum using first principles.....	51
<i>Akeem Adekunle Adewale, Abdullah Chik, Ruhiyuddin Mohd Zaki</i>	
Study of thermoelectric properties of Sr _{0.92} A _{0.08} TiO ₃ (A=Yb / Tm) perovskite oxide using density functional theory method	61
<i>Akeem Adekunle Adewale, Abdullah Chik, Ruhiyuddin Mohd Zaki</i>	
The Effect Of Filler Content and Chemical Modification On The Properties Of Poly(Lactic Acid)/Pandanus Amaryllifolius Biocomposite Films	68
<i>Mohd Rasidi, Mohd Syahmie, Chew, Kang Wei, Mohd Nasib, Amira</i>	
Effect of Surface Treatment on Mechanical Properties of Rice Husk Reinforced Recycled High Density Polyethylene (rHDPE) Composites.....	77
<i>Mohd Nazry Salleh, Roslaili Abdul Aziz, Mohd Fairul Sharin Abdul Razak, Luqman Musa, Hong Li Ying</i>	
Corrosion Investigation of Sn-0.7Cu Pb-Free Solder in Open-Circuit and Polarized Conditions.....	85
<i>Mohd Zohirul Haziq Aziz, Nasihah Zainon, Ahmad Azmin Mohamad, Muhammad Firdaus Mohd Nazeri</i>	
High Temperature Cyclic Oxidation of Ni-based 800H Superalloy at 700°C in Air	92
<i>Noraziana Parimin, Esah Hamzah</i>	

Effect of Dynamic Vulcanization on Properties of Linear Low Density Polyethylene/Natural Rubber Filled with Calcium Carbonate	98
<i>Loh Annie, Mohamad Kahar Ab Wahab, Elammaran Jayamani</i>	
Preparation and characterization of LDPE/TPS blend filled with calcium carbonate	108
<i>Anis Adila Ab Halim, Mohamad Kahar Ab Wahab</i>	
Structural and dimensional analysis of LDPE/TPS blend filled with calcium carbonate	117
<i>Anis Adila Ab Halim, Mohamad Kahar Ab Wahab</i>	
The Effect of Modified Jackfruit (Artocarpus Heterophyllus Lam.) Seed Starch on the Properties of Poly Lactic Acid	125
<i>Nur Amira Sahirah Abdullah, Mohamad Kahar Ab Wahab</i>	
The effect of twin screw compounding parameters on the tensile properties of pineapple leaf/sea shell hybrid polymer composite using DOE approach	139
<i>Ng Tian Ching, Khairul Anwar Abdul Halim, Mohd Firdaus Omar, Azlin Fazlina Osman, Muhammad Salihin Zakaria</i>	
The Effect of Polypropylene Grafted Maleic Anhydride on the Polypropylene / Natural Rubber Blends Filled with Cyperus Odoratus.....	147
<i>Norfatulikmah Zainal Abidin, Mohamad Kahar Ab Wahab</i>	
Dynamic Vulcanization of Polypropylene / Natural Rubber Blends Filled with Cyperus Odoratus.....	162
<i>Norfatulikmah Zainal Abidin, Mohamad Kahar Ab Wahab</i>	
Tensile Properties of Polyethylene Composites Based Kaolin Geo-Filler	176
<i>Loh Zhen Lun, Yusrina Mat Daud, Farah Farhana Zainal, Mohammad Firdaus Abu Hashim, Hasri, Hartati, Tan Wei Shern</i>	
Failure Analysis on U-Bend Header Tube of Boiler Economizer	182
<i>Nur Farhana Hayazi, Shaiful Rizam Shamsudin, Rajaselan Wardan</i>	
The efficiency of Zero Charge Corrosion Protection on pure Mg by Planned Interval Test	188
<i>Shaiful Rizam Shamsudin, Muhamad Syazwan Sanusi, Rajaselan Wardan, Azmi Rahmat, Mohd Nazree Derman</i>	
Effect of Sodium Bicarbonate Additions on the Physical, Mechanical and Bioactive Property of Sol-Gel Bioglass	194
<i>SyedAdam Syed Nuzul Fadzli, Alias Suffi Irni, Zainuddin Firuz</i>	
Effect of Photoetching Process onto Immobilized PANI/TiO ₂ Films Towards Photocatalytic Degradation of RR2 dye	201
<i>Sharin Razak, Nazry Salleh, Wan Izhan Nawawi, Nadiah Natar</i>	
Preparation of a Visible light Active N-doped TiO ₂ Photocatalyst using Microwave Irradiation Technique	206
<i>Wan Izhan Nawawi, Sharin Razak, Fazeri</i>	
Low temperature prepared N doped TiO ₂ photodegradation of janus green B	211
<i>Siti Aisyah Othman, Siti Nurjannah Zainon, Mohd Fauzi Abdullah, Wan Izhan Nawawi, Syahirul Ikhwan, Sharin Razak</i>	
A short review on polyaniline (PANI) based nanocomposites for various applications: enhancing the electrical conductivity.....	217
<i>NorAisah Khalid, Jeefferie Abd Razak, Hazman Hasib, MohdMuzafar Ismail, Noraiham Mohamad, Ramli Junid, Poppy Puspitasari</i>	

A short review on polyurethane-based nanocomposites for various applications	224
<i>Marina Mohamad, Jeefferie Abd Razak, Noraiham Mohamad, Sahrim Haji Ahmad, Ramli Junid, Poppy Puspitasari</i>	
The mixture material of dried straw and kapok for acoustic treatment for UTeM mosque.....	231
<i>Mohd Muzafer Ismail, Jeefferie Abd Razak, Ramli Junid, NorAisah Khalid, Faiz Arith, Maizatul Alice Meor Said</i>	
Effect of using Palm Char and Coke as a Reductant in Production of Ferrosilicon	236
<i>Nur Farhana Mohd Yunos, Muhammad Asri Idris, Sri Raj Rajeswari Munusamy, K. Perumal</i>	
Sugarcane Bagasse Reinforced Polyester Composites: Effects of Fiber Surface Treatment And Fiber Loading on The Tensile And Flexural Properties	243
<i>Muhammad Salihin Zakaria, Luqman Musa, Razif Muhammed Nordin, Khairul Anwar Abdul Halim</i>	
The effect of graphite flakes (GFs) and hybrid graphene nanoplatelets (GNPs) particles to the mechanical properties of epoxy composites	251
<i>Nurhazwani Abu Bakar, Mohd Arif Zulkarnain, Wan Anuar Wan Hassan, Ramli Junid, Jeefferie Abdul Razak, Mohd Muzafer Ismail</i>	
Morphology and Conductive Properties of Carbon Black- and Graphite- Filled Conductive E epoxy Micro-porous	259
<i>Anusha Leemsuthep, Zunaida Zakaria, Du Ngoc Uy Lan</i>	
Effect of Porosity and Water Absorption on Compressive Strength of Fly Ash based Geopolymer and OPC Paste	266
<i>SitiAisyah Razak, Farah Farhana Zainal, Shaiful Rizam Shamsudin</i>	
Preparation of Bimetallic Catalyst: Gold-Copper (Au-Cu) Nanoparticles for Catalytic Reduction of p-Nitrophenol	274
<i>Norizwan Nordin, NurulAdilah Md Noor, Najwa Afifi Abdul Wahab, Hanani Yazid, AbdulMutalib Md Jani</i>	
The effect of choline chloride: acetamide deep eutectic solvent to physicochemical and mechanical properties of pectin-based bioplastic	281
<i>Mohamad Azhar Azman, Yusof Rizana, Samsudin Dalina, Roziana Mohamed Hanaphi</i>	
Effect of glutaraldehyde as crosslinker on the properties of cellulose nanocrystal/chitosan films.....	287
<i>Pei Gie Gan, Sung Ting Sam, MohdFirdaus Omar, Mohammad Faiq Abdullah</i>	
Optimization of Injection Moulding Processing Parameters for LDPE/RH Composites Tensile Strength Through Full Factorial Experiment.....	292
<i>Haliza Jaya, Nik Noriman Zulkepli, Mohd Firdaus Omar, Shayfull Zamree Abd Rahim, Khairul Anwar Abdul Halim</i>	
Synthesis and Characterizations of Fe ₃ O ₄ Added with Al ₂ O ₃ Nanoparticles via Sol-Gel Technique.....	297
<i>MohdShahadan Mohd Şuan, Chew Ke Chin, Jeefferie Abd Razak, Hazman Hasib, MohdAsyadi 'Azam Mohd Abid, Irwan Nurdin</i>	
Preliminary Study of Hydrothermal Synthesis of TiO ₂ -GO Composites as a High Performance Photocatalyst	304
<i>N.M.N Azira, D. Murizam, D.S.C. Halin, M.A. Idris, N. F. M. Yunos</i>	
Building Information Modelling (BIM) as an UAV Information Processor for Generating an 'As Built Drawing'.....	312
<i>Norsyakilah Romeli, Hazry Desa, Muhammad Azizi Aziz</i>	

Development of iron thin films by electron beam physical vapour deposition (EBPVD): A Review.....	318
<i>Nur Izzati Muhammad Nadzri, Dewi Suriyani Che Halin, Athirah Khemar, Mohd Asyraf M. Hasbi, Yufridin Wahab</i>	
The Correlation between Palm Shell Char Properties and the Production of Metallic Iron in EAF Steelmaking Slag Reduction Reaction.....	323
<i>Anis Nadhirah Ismail, Nur Farhana M. Yunos, M. Sri Raj Rajeswari, M. A. Idris</i>	
A Recent blend of thermoplastic polyurethane (TPU)	331
<i>Nor Azwin Ahad</i>	
Assessment of Mechanical Properties of Recycled HDPE and LDPE Plastic Wastes	339
<i>Bibi Intan Suraya Murat, Muhammad Syarifuddin Kamalruzaman, Mohamad Hafiz Nor Azman, Muhamad Fazlee Misroh</i>	
Superconducting Lead-free Solder Joint: A Short Review	346
<i>Rita Mohd Said, Mohd Arif Anuar Mohd Salleh, Norainiza Saud, Mohd Izrul Izwan Ramli</i>	
Determination of Protective Potential in the Zero Charge Corrosion Protection System.....	352
<i>Shaiful Rizam Shamsudin, Rajaselan Wardan, Azmi Rahmat, Mohd Nazree Derman, Muhamad Syazwan Sanusi, Mohd Fitri Mohamad Wahid</i>	
A Short Review on Selection of Electrodes Materials for Symmetrical Solid Oxide Fuel Cell.....	358
<i>Wan Nor Anasuhah Wan Yusoff, Nurul Akidah Baharuddin, Mahendra Rao Somalu, anastuti Mughtar, Abdullah Abdul Samat</i>	
Effect of Different Filler Loading on Flexural Properties and Water Absorption Behavior of Kenaf Core Fiber Reinforced Polypropylene Composite.....	363
<i>Nur Rusyidah Mustapa, A. R. Rozyanty, Mohd Hanif Mohd Pital</i>	
The effect of aging time on microstructure and hardness value of AZ80 Mg Alloy	371
<i>Zuraidawani Che Daud, Siti Hajar Azahar, Mohd Nazree Derman, Nur Maizatul Shima Adzali, Nur Hidayah Ahmad Zaidi, Sinar Arzuria Adnan</i>	
Bonding and Phases Analysis of Geopolymer Materials.....	378
<i>Nor Shida Dalila Mohd Azhar, Farah Farhana Zainal, Mohd Mustafa Al Bakri Abdullah</i>	
Effect of Pulse Frequencies on Low Carbon Steel in 3.5 wt% NaCl Solution under Zero Charge Corrosion Protection.....	383
<i>Rajaselan Wardan, Shaiful Rizam Shamsudin, Mohd Fitri Mohamad Wahid, Muhammad Syazwan Sanusi</i>	
Review on the effect of Gallium in solder alloy	389
<i>M.N Ervina Efzan, M.N Nur Faziera</i>	
Phase formation and microstructure analyses of La _{0.6} Sr _{0.4} CoO _{3-δ} -BaCe _{0.54} Zr _{0.36} Y _{0.10} Zr _{0.02} composite material prepared by solid state mixing method.....	394
<i>Abdullah Abdul Samat, Muhammad Syafiq Amsyar Ahmad Pisor, Meor Ahmad Faris Meor Ahmad Tajudin, Mohd Al-Hafiz Mohd Nawawi, Murizam Darus, Nafisah Osman, Nurul Akidah Baharuddin</i>	
Cryorolling of SAC305 solder : Microstructure analysis and shear strength of solder joint	401
<i>Nurulakmal Mohd Sharif, Wan Asilah Wan Azalan</i>	
Tin and germanium substitution in lead free perovskite solar cell: current status and future trends	407
<i>Ayu Wazira Azhari, Faith Shi Xin Then, Dewi Suriyani Che Halin, Suhaila Sepeai, Norasikin Ahmad Ludin</i>	

The Effect of Sodium Hydroxide (NaOH) Solution Concentration on Properties of Geopolymer Paste	413
<i>Farah Farhana Zainal, Nurqistina Sulotoha, Yusrina Mat Daud, Mohammad Firdaus Abu Hashim, Hasri, Hartati</i>	
A short review: Properties of superconducting solder	420
<i>M.S. Chang, M.A.A. Mohd Salleh, D.S.C. Halin</i>	
The Effect of Germanium Addition on the Lead-free Solder Alloys: A Short Review	426
<i>Chi Ying Tan, Mohd Arif Anuar Mohd Salleh, Norainiza Saud</i>	
Thermal behaviour and microstructural analysis of Sn-40Pb alloy and Sn-40Pb soldered on electroless nickel/immersion gold	431
<i>Ai Ling Teoh, Mohd Arif Anuar Mohd Salleh, Dewi Suriyani Che Halin, Kai Loong Foo</i>	
Preliminary study on the effect of Ni addition on tin (Sn) whisker growth from lead-free solder coating	437
<i>Aimi Noorliyana Hashim, Mohd Arif Anuar Mohd Salleh, Muhammad Mahyiddin Ramli, Khor Chu Yee, Noor Zaimah Mohd Mokhtar</i>	
Impact of Thermal Ageing and Multiple Reflow on Lead Free Composite Solder : A Short Review	443
<i>Nur Syahirah Mohamad Zaimi, Mohd Arif Anuar Mohd Salleh, Mohd Mustafa Al Bakri Abdullah, Marliza Mostapha, Romisuhani Ahmad</i>	
Effect of infill pattern on mechanical properties of 3D printed PLA and cPLA	450
<i>Cheow Keat Yeoh, Chee Son Cheah, Raguvaran Pushpanathan, Cheah Chie Song, Mei Ai Tan, Pei Leng Teh</i>	
Influence of squeegee impact on stencil printing process: CFD approach	459
<i>M.H.H. Ishak, M.S. Abdul Aziz, M.H.S. Abdul Samad, Farzad Ismail, M.A.A Mohd Salleh</i>	
Development of Integrated Solar Water Heater Using Phase Change Material	467
<i>Yamuna Munusamy, Ong Kok Seng</i>	
Influence of electron beam irradiation on crosslink behaviour of reclaimed tire rubber/EVA blend in the presence of radiation sensitizers	475
<i>Suganti Ramarad, Chantara Theyy Ratnam, Mohammad Khalid, Luqman Chuah</i>	
Mechanical performance and thermal behaviour of Carrageenan Gel with Lavender Essential Oil	483
<i>Khairul Anuar Mat Amin, Taqiah Abdul Hadi</i>	

Author Index