



**Advanced Materials and
Manufacturing Engineering II**

**Ramya Muthusamy
Thangaprakash Sengodan**

Advanced Materials and Manufacturing Engineering II

Selected peer-reviewed full text papers from the
3rd International Conference on
Materials Science and Manufacturing Technology
(ICMSMT 2021)

Edited by
Ramya Muthusamy
Thangaprakash Sengodan



ISBN: 978-3-0357-1268-1

Materials Science Forum Vol. 1048

Electronically available at www.scientific.net



TTP TRANS TECH PUBLICATIONS



Materials Science Forum

ISSN 0255-5476

Founding Editor:

Fred H. Wöhlbier

Honorary Editor:

Prof. Graeme E. Murch, University of Newcastle, PRC for Geotechnical Science and Engineering, School of Engineering; University Drive, Callaghan, Australia, NSW 2308;

Editor in Chief:

Prof. Iulian Antoniac, University Politehnica of Bucharest, Faculty of Materials Science and Engineering; 313 Splaiul Independentei, Bucharest, 060042, Romania;

Prof. Guillermo Requena, German Aerospace Center (DLR), Institute of Materials Research; Köln, DE-51170, Germany;

Editorial Advisory Board: *see back inside cover.*

Aims and Scope:

“Materials Science Forum” specializes in the publication of thematically complete volumes from international conference proceedings and complete special topic volumes. We do not publish stand-alone papers by individual authors.

“Materials Science Forum” is a peer-reviewed journal which covers all aspects of theoretical and practical research of materials science: synthesis, analysis of properties, technology of materials processing and their use.

“Materials Science Forum” is one of the largest periodicals in its field.

Abstracted/Indexed in:

SCOPUS www.scopus.com.

REAXYS www.reaxys.com.

Ei Compendex www.ei.org/.

Chimica <https://www.elsevier.com/solutions/engineering-village/content#chimica>.

SCImago Journal & Country Rank (SJR) www.scimagojr.com.

InspeC (IET, Institution of Engineering Technology) www.theiet.org.

Chemical Abstracts Service (CAS) www.cas.org.

Google Scholar scholar.google.com.

GeoRef www.americangeosciences.org/georef.

NASA Astrophysics Data System (ADS) <http://www.adsabs.harvard.edu/>.

INIS Atomindex (International Nuclear Information System) <https://inis.iaea.org>.

Cambridge Scientific Abstracts (CSA) www.csa.com.

ProQuest www.proquest.com.

Ulrichsweb www.proquest.com/products-services/Ulrichsweb.html.

EBSCOhost Research Databases www.ebscohost.com/.

CiteSeerX citeseerx.ist.psu.edu.

Zetoc zetoc.jisc.ac.uk.

EVISA <http://www.speciation.net/Public/Linklists/EVISA.html>.

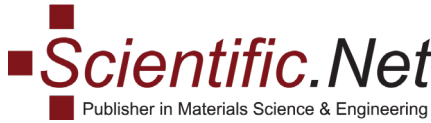
Index Copernicus Journals Master List www.indexcopernicus.com.

WorldCat (OCLC) www.worldcat.org.

Internet:

The book/ebook is available in full text via www.scientific.net/book

ISSN print 0255-5476 ISSN web 1662-9752



Publisher in Materials Science & Engineering

Trans Tech Publications Ltd

Kapellweg 8 • CH-8806 Baech • Switzerland

Fax +41 (44) 922 10 33 • e-mail: office@scientific.net

<https://www.scientific.net>

Materials Science Forum

ISSN 0255-5476

Editorial Board:

Prof. Dezső L. Beke

University of Debrecen, Department for Solid State Physics; Bem tér 18/b, Debrecen, 4026, Hungary;

Prof. Giorgio Benedek

University of Milano Bicocca, Department of Materials Science; U5, Università di Milano-Bicocca, Via R. Cozzi 55, Milano, 20125, Italy;

Dr. Giacomo Benvenuti

ABCD Technology; Switzerland;

Prof. Anil K. Bhatnagar

University of Hyderabad, School of Physics and School of Engineering; Hyderabad, India, 500046;

Prof. Chi Ming Chan

Hong Kong University of Science and Technology, Department of Chemical and Biomolecular Engineering, Clear Water Bay; Kowloon, China;

Dr. Abel S. Fenta

CERN; Genève, CH-1211, Switzerland;

Roberto B. Figueiredo

Federal University of Minas Gerais, Department of Metallurgical and Materials Engineering; Belo Horizonte, MG, 30, Brazil, 31270-901;

Prof. Hermann G. Grimmeiss

Lund University, Department of Solid State Physics; Box 118, Lund, 221 00, Sweden;

Prof. Jerzy Jedlinski

AGH University of Science and Technology, Faculty of Materials Science and Ceramics, Department of Physical Chemistry and Modeling of Processes and Surface Engineering; al. Mickiewicza 30, Kraków, 30-059, Poland;

Prof. Megumi Kawasaki

Oregon State University, School of Mechanical, Industrial and Manufacturing Engineering; 204 Rogers Hall, Corvallis, USA, 97331;

Prof. Terence G. Langdon

University of Southampton, Faculty of Engineering and the Environment; Lanchester Building (Bldg. 7), Highfield Campus, Southampton, United Kingdom, SO17 1BJ;

Prof. Jai Sung Lee

Hanyang University, Department of Metallurgy and Materials Science; 55 Daehak-no, Sangnok-gu, Ansan, Korea, South, 426-791;

Prof. Eric J. Mittemeijer

Max Planck Institute for Intelligent Systems; Heisenbergstrasse 3, Stuttgart, 70569, Germany;

Prof. Stephen J. Pearton

University of Florida, Department of Materials Science and Engineering; Gainesville, USA, 32611-6400;

Prof. Vassilis Pontikis

Commissariat à l’Energie Atomique et les Energies Alternatives (CEA), CEA-Saclay; Bdg. 524, Gif-sur-Yvette, 91191, France;

Prof. András Roósz

Hungarian Academy of Sciences, Miskolc University (HAS-MU); Miskolc-Egyetemváros, 3515, Hungary;

Prof. David N. Seidman

Northwestern University, Department Materials Science and Engineering; Cook Hall, 2220 Campus Drive, Evanston, USA, 60208;

Dr. Ching Hua Su

NASA/Marshall Space Flight Center, EM31 NASA/Marshall Space Flight Center; Huntsville, USA, 35812;

Prof. David Tomanek

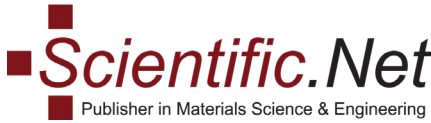
Michigan State University, Physics and Astronomy Department; 567 Wilson Road, East Lansing, USA, MI 48824-6455;

Prof. A.S. Wronski

University of Bradford, School of Engineering, Design and Technology; West Yorkshire, Bradford, United Kingdom, BD7 1DP;

Emeritus Prof. David J. Young

University of New South Wales, School of Materials Science and Engineering; Sydney, Australia, NSW 2052;`



Publisher in Materials Science & Engineering

Trans Tech Publications Ltd

Kapellweg 8 • CH-8806 Baech • Switzerland

Fax +41 (44) 922 10 33 • e-mail: office@scientific.net

<https://www.scientific.net>



Advanced Materials and Manufacturing Engineering II

Selected peer-reviewed full text papers from the
3rd International Conference on
Materials Science and Manufacturing Technology
(ICMSMT 2021)

Edited by
Ramya Muthusamy
Thangaprakash Sengodan

Advanced Materials and Manufacturing Engineering II

Selected peer-reviewed full text papers from the
3rd International Conference on
Materials Science and Manufacturing Technology
(ICMSMT 2021)

Selected peer-reviewed full text papers from the
3rd International Conference on Materials Science and
Manufacturing Technology (ICMSMT 2021),
April 08-09, 2021, Tamil Nadu, India

Edited by

Ramya Muthusamy and Thangaprakash Sengodan

■ **Scientific.Net**

Copyright © 2022 Trans Tech Publications Ltd, Switzerland

All rights reserved. No part of the contents of this publication may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

Trans Tech Publications Ltd
Kapellweg 8
CH-8806 Baech
Switzerland
<https://www.scientific.net>

Volume 1048 of
Materials Science Forum
ISSN print 0255-5476
ISSN web 1662-9752

Full text available online at <http://www.scientific.net>

Distributed worldwide by

Trans Tech Publications Ltd
Kapellweg 8
CH-8806 Baech
Switzerland

Phone: +41 (44) 922 10 22
Fax: +41 (44) 922 10 33
e-mail: sales@scientific.net

Preface

Materials and technologies are significant elements for all kinds of high-tech industries that pave the road for advancements in the manufacturing area. With the rapid development of computer technology, communications technology, and network technology, the traditional manufacturing process has evolved to intelligent manufacturing that is more technologically flexible and efficient.

The Third International Conference on Materials Science and Manufacturing Technology 2021 (ICMSMT 2021) was a premier interdisciplinary platform for researchers, academicians, and practitioners worldwide to present recent developments in materials sciences and manufacturing technology. The third edition of the ICMSMT conference series (ICMSMT 2021) has been organized with partnered by Akshaya College of Engineering and Technology, Coimbatore, and Diligentec Solutions, Coimbatore, India. The conference received submissions from 9 countries, and the editorial board of ICMSMT has accepted the papers after the stringent screening and review process. ICMSMT is a scientific event and aimed to be conducted in the second week of April every year.

Due to the COVID-19 outbreak worldwide, followed by the national and international travel restrictions, the ICMSMT 2021 was organized in an online model. Each presenter was given ten minutes for the presentation and three minutes for queries and discussion. The entire meeting has been conducted using the Google Meet platform.

Dr. Ramya Muthusamy
Editor / Chair – TPC
ICMSMT 2021

Committees

Conference Chairs

Dr. Thangaprakash Sengodan, Diligentec Solutions, Coimbatore, India

Dr. Suguna N, Joint Director, Akshaya College of Engineering Technology, India

General Chairs

Dr. Baharudin Bin Ismail, Universiti Malaysia Perlis, Malaysia

Dr. Jaya J, Principal, Akshaya College of Engineering and Technology, India

Organizing Chairs

Dr. Senthilkumar S, Diligentec Solutions, Coimbatore, India

Dr. Kathiravan N, Dean(Academics), Akshaya College of Engineering and Technology, India

Editorial Committee

Editor

Dr. Ramya Muthusamy, Diligentec Solutions, Coimbatore, India

Members

Dr. Sivakumar R, Akshaya College of Engineering and Technology, India

Dr. Sendhil Kumar S, Akshaya College of Engineering and Technology, India

Dr. Anithasree A, Akshaya College of Engineering and Technology, India

Review Committee

Chair

Dr. Markas Law Lee Lam, National University of Singapore, Singapore

Members

Dr. Rajkumar N, Akshaya College of Engineering and Technology, India

Dr. Viji C, Akshaya College of Engineering and Technology, India

Information Contact

Dr. Kapilan S, Akshaya College of Engineering and Technology, India

Publicity and Promotions

Mr. Sivakumar K, Diligentec Solutions, Coimbatore

Table of Contents

Preface	v
Committees	vi
 Chapter 1: Polymers and Composites	
Contriving and Assessment of Magnesium Alloy Composites Augmented with Boron Carbide VIA Liquid Metallurgy Route	
J.A. Jeffrey, S.S. Kumar, V.A. Roseline, A.L. Mary and D. Santhosh	3
Production and Assessment of AZ91 Reinforced with Nano SiC through Stir Casting Process	
J.A. Jeffrey, S.S. Kumar, P. Hariharan, M. Kamesh and A.M. Raj	9
Incorporation of Magnetite in Toughened PLA Nanocomposite: Tensile and Thermal Stability	
R.S. Chen and S. Ahmad.....	15
Effect of Halloysite Nanotubes on Physico-Mechanical Properties of Silk/Basalt Fabric Reinforced Epoxy Composites	
S.M. Darshan and B. Suresha	21
Influence of Micro and Nano Particles on Mechanical Behaviour of Slag Reinforced AA7075 Composites	
I.G. lakshmi, Y.R. Kanth and J.B. Rao	33
Microstructure Evaluation on Micro and Nano Slag Particles Reinforced AA7075 Composites	
I.G. lakshmi, Y.R. Kanth, I.N. Murthy and J.B. Rao.....	43
A Novel Method to Choose the Experimental Parameters in Large Amplitude Oscillatory Shear Rheology	
J. Kodavaty, R.K.P.K. Pannala, S. Wasson, M. Mittal and A. Irshad	54
Characterization and Comparison of Areca Sheath Ash (ASA) and Rice Husk Ash (RHA) for Silica Potential	
P.P. Kulkarni, B. Siddeswarappa and M. Channalli	65
Corrosion Resistance of Electroless Ni-P-W/ZrO₂ Nanocomposite Coatings in Peracid Solutions	
S. Hassan, A. Ansari, A. Kumar, M. Ram, S. Sharma and A. Sharma.....	72
 Chapter 2: Functional Materials	
Thermal Conductivity Analysis of Ethylene Glycol/H₂O- Based MgFe₂O₄ Ferrofluid	
K. Ajith, A.S. Pillai, I.V.M.V. Enoch and A.B. Solomon	83
Study of Parameters Affecting the Aging of Transformer Oil	
S.T. Selvi, M. Saranathan, P.H.K. Achuthan, R. Abhishek and A. Ravi.....	89
Influence of Nano Filler (ZrO₂) on Optical and Thermal Studies of Potassium Doped Polyethylene Oxide Solid Polymer Electrolytes	
S. Sripada, M.C. Reddy, T. Sreekanth, R. Siripuram and K. Venkateshwarlu.....	101

Structural and Transport Properties of $\text{La}_{0.85}\text{Te}_{0.15}\text{MnO}_3$ Manganite and its Composite with Al_2O_3

D.A. Dadhania, G.D. Jadav, S.K. Chavda and J.A. Bhalodia..... 110

Microstructural Analysis of Copper Foil Etched and Annealed in ECR Plasma Reactor

S. Karmakar, S.K. Kundu, A. Mukherjee, S.K. Bandyopadhyay, S. Bhattacharyya and G.S. Taki 121

EPR Study of CeO_2 Nano Particles

D. Uthra and M.P. Sharma..... 130

Chapter 3: Materials for Microelectronics and Photovoltaics

Synthesis, Structural, Morphological and I-V Characteristics of Polyaniline-MgCl Composite

M. Nagaraja, G. Thippeswamy, S. Prashanth, J. Pattar and M.H. Mahesh 141

Analysis of $\text{InN}/\text{La}_2\text{O}_3$ Twosome for Double-Gate MOSFETs for Radio Frequency Applications

N. Gowthaman and V. Srivastava..... 147

Ti Doped Cu_2O Thin Films: DC Magnetron Sputtering and Structural and Optical Studies

M. Lavanya, S.S. Ratnam and T. Rao..... 158

Studies on Copper Nanometric-Film Deposited by an In-House Developed DC Magnetron Sputtering System

S.K. Kundu, S. Karmakar, S.K. Bandyopadhyay, S. Bhattacharyya and G.S. Taki..... 164

Numerical Investigation into Photovoltaic Performance of Organolead Trihalide Perovskite Quantum Dot Intermediate Band Solar Cell

S. Roy, M.S. Rahman, D. Kundu, F.A. Piata and M.R. Islam..... 172

Temperature Dependent Carrier Transport in Hydrogenated Amorphous Semiconductors for Thin Film Memristive Applications

M. Chakraverty and V.N. Ramakrishnan..... 182

Influence of Substrate Temperature on Structural and Optical Properties of Co-Evaporated $\text{Cu}_2\text{SnS}_3/\text{ITO}$ Thin Films

T.S. Reddy and M.C.S. Kumar 189

Sol-Gel Processed ZrO_2 Based Forming-Free Resistive Switching Memory Devices

K.M. Shafi, K.M. Shibu, N.K. Sulfikarali and K.P. Biju..... 198

Chapter 4: Physical Chemistry, Research and Computational Modelling

Conductivity Tensor in Cylindrical Quantum Wire with Parabolic Potential for the Case of Electron-Acoustic Phonon Scattering

H.V. Ngoc 205

Electronic Properties of Aldehyde Complexes Using DFT for Electrooptical Activity

M. Prasanti, A. Jha and C.R.S. Kumar..... 212

Generalized Version of ISI Invariant for some Molecular Structures

K. Pattabiraman, M. Kameswari and M. Seenivasan..... 221

Synthesis, Characterization and DFT Calculations of a Novel Pyrazole Derivative 4-(1-Phenyl-5-(p-Tolyl)-2,5-Dihydro-1H-Pyrazol-3-Yl)Benzo[c][1,2,5]Oxadiazole	
P. Priyanka, S. Sivapriya, M. Gopalakrishnan, S. Pazhamalai, M. Seenivasan and H. Manikandan	227

Chapter 5: Materials Processing Technologies

Numerical Simulation of Friction Stir Spot Welding of Aluminium-6061 and Magnesium AZ-31B	
A. Baruah, J. Murugesan and H. Borkar	241
Characterization of HVOF Sprayed Al₂O₃ - CeO₂ Coatings Deposited on Mg Az 91 Alloy	
K.V. Prasad and H. Adarsha	254
WEDM Machining Performance of Al Based Metal Matrix Composites Reinforced with Rice Husk Ash	
Z. Seikh, S. Kunar, R. Haque, S. Haidar and M. Sekh	261
Numerical and Experimental Studies on Hydro-Forming of a Thin Metallic Disc	
K. Gopinath, V. Narayanamurthy and Y.V.D. Rao	270
Proposal of an Innovative Benchmark for the Evaluation of 3D Printing Accuracy for Photopolymers	
P. Minetola, V. de Freitas Pacheco, M. Massarani, F. Calignano and G. Marchiandi	279
Impact of Cutting Parameters on Cutting Force of AISI 410 and AISI 420 MSS during CNC Dry Milling	
P. George, D.P. Selvaraj and P. George.....	291
A Comparative Experimental Study on Machining Performance of Aluminium against Advanced Diamond Coated Cutting Tool Inserts	
D.K. Sahu, K.P. Kumar and R.I. Yadav	298

Chapter 6: Building Materials and Structural Elements

Compressive Strength and Chloride Ion Permeability Test of Concrete Incorporating Fly Ash and GGBS with Diverse Water Binder Ratio	
T. Gehlot, S.S. Sankhla and S. Parihar	311
Improving the Performance of Structural Members by Incorporating Incinerated Bio-Medical Waste Ash in Reinforced Geopolymer Concrete	
A.K. Suresh, M. Muthukannan, R.K. Devi, K.K. Arun and G.A. Chithambar	321
Structural Behaviour of Green Geopolymer Concrete Beams and Columns Made with Waste Wood Ash a Partial Substitution Binder	
K.K. Arun, M. Muthukannan, R.R. Abinaya and A.K. Suresh.....	333
Flexural Behaviour of Reinforced Geopolymer Concrete Incorporated with Hazardous Heavy Metal Waste Ash and Glass Powder	
A.K. Suresh, M. Muthukannan, A.D.K.B. Irene, K.K. Arun and A.C. Ganesh	345
A Comparative Investigation on Normal and High Strength Concrete Beams under Torsion	
I.H. Mohammed, A.M.S.A. Aamri, S. Javed and Y.U.A. Shamsi.....	359
Modelling the Yield Stress of Fly-Ash Added Superplasticized Cement Paste at Different Temperatures Using Artificial Neural Network	
P. Chandrasekar, A. Nourin, A.S.N.B. Aravind Gupta, B.V. Jyoshna and D. Sathyan.....	366

Effective Utilization of Industrial and Agricultural Waste for Developing Sustainable Self-Compacting Concrete	
M.S. Riyana, D. Sathyan and M.K. Haridharan.....	376
Axial Compression Behaviour Analysis of Insulated Concrete Form (ICF) Wall Panel with Fibre Cement Board	
J.J. Shelton, M. Izazs, C. Daniel and A.A. Solomon	387
Effect of Using Ground Granulated Blast Furnace Slag in Rigid Pavement Overlays	
H.C. Guruprasad, R. Sridhar and R. Ravi Kumar	396
Effect of Flyash- Rice Husk Ash Blend in the Energy Efficient Geopolymer Tiles Using Industrial Wastes	
A.C. Ganesh, K. Mukilan, B.P.V. Srikar, L.V.S. Teja, K.S.V. Prasad, A.A. Kumar and R.P. Sharath.....	403
Experimental Investigation on Fresh and Hardened Properties of High Calcium Flyash Based Geopolymer Concrete	
V.B. Prasad, A.P. Kumar, N. Anand, P.D. Arumairaj, T. Dhillip and M.S. Kumar.....	412
Chapter 7: Phytochemistry and Pharmacology, Food and Biomass Processing	
Traditional Peruvian Medicine: An Insight in Geophagy and Machu Rumi Intake	
H.N. Chui-Betancur, D.R. Acosta, G. Belizario-Quispe and R. Alfaro-Alejo	423
Preliminary Chemical, Total Phenolic Content, Flavonoid Content, and Antioxidant Activity of some Plants Used in Vietnam Folk Medicine	
N.N. Quy, D.D. Chung, N.H.V. Hieu, N.T.N. Bich, M.H. Cang and N.T.C. Quyen	429
Mechanical Extraction of Neem Seed Kernel (<i>Azadirachta indica</i> A. Juss.) Harvesting in Ninh Thuan, Viet Nam by Using Hydraulic Pressing: Effect of Processing Parameters	
D.N. Do, H.D. Pham, X.T. Le, M.T. Le, N.P. Nguyen, Q.M. Bui and X.C. Luu.....	437
Modelling of Liquid-Liquid Equilibria Using NRTL and UNIFAC Equations in the Extraction of Bio-Oil-Based Phenolics Produced from the Pyrolysis of Sugarcane Bagasse	
D.S. Fardhyanti, S. Kadarwati, H. Dewajani, A. Rosadi and W.M. Alfriansyah	445
Hydrolysis of <i>S. platensis</i> Using Sulfuric Acid for Ethanol Production	
Megawati, A. Damayanti, R.D.A. Putri, Z.A.S. Bahlawan, A.A.D. Mastuti and R.A. Tamimi	451
Adsorptive Removal of Copper from Waste Water Using Biomass & Biochar Based Materials	
S. Sireesha, U. Upadhyay, I. Sreedhar and K.L. Anitha	459
Extraction of Essential Oil Form Sweet Lime Orange Peel: A Comparison Study	
S.A. Kadapure, P. Kadapure, C. Anjali, B. Akansha, B. Sabera, M. Sanket and A. Shet	468
The Influencing Factors on the Production of Alcoholic Drinking from Jackfruit (<i>Artocarpus heterophyllus</i> L.)	
V.N. An, V.T. Pham, V.L. Do, N.Q. Duy, T.T. Dang and T.T. Hien.....	476
Pomelo (<i>Citrus grandis</i> L.) Essential Oil Extraction: A Comparison between Hydrodistillation and Microwave Assisted Hydrodistillation	
T.T.K. Ngan, T.T. Hien, D.T. Phat, L.T.N. Minh, H.B. Long and X.T. Le	485
Polyphenol, Flavonoid Content and Antioxidant Activity of the Garlic (<i>Allium sativum</i> L.) Extract Obtained by Two Different Extraction Processes	
K.D. Huynh, V.T. Pham, V.K. Tran, H.D. Pham and T.N. Pham	493

Production Process of a Nutritional Drink from Mango (*Mangifera indica*)

Q.M. Vu, V.T. Pham, V.L. Do, T.B. Long, N.T.T. Trang, N.Q. Duy and N.P.T. Nhan 502

Production Process of a Carbonated Drink from Red Flesh Dragon Fruit (*Hylocereus polyrhizus*)

H.T.Q. Mai, V.T. Pham, V.L. Do, T.B. Phuc, T.T. Truc and T.T.K. Ngan..... 514

The Initial Study on the Application of Sewage Sludge for Agriculture on the Laboratory Scale

T. Tran, L.V. Giang, H.H. Loc, L.T.A. Hong, V.D. Thi and L.V. Tan 524

Effects of Storage Conditions on Quality Change of Minimally Dried Jackfruit (*Artocarpus heterophyllus* Lam.) BulbsC.K. Van, V.T. Pham, N.P.T. Nhan, N.H.K. Nguyen, M.K. Nguyen, V.L. Do
and N.T. Quoc..... 531**Keyword Index** 539**Author Index** 543

Keyword Index

3D Printing.....279
7075 Aluminium Alloy.....33

A

AA7075 Alloy.....43
ABTS429
Accuracy279
Acoustic Phonon205
Adhesion298
Agricultural Application524
Agricultural Waste524
Alccofines396
Aldehydes.....212
Allium sativum L.493
Aluminium261, 298
Aluminum Oxide.....254
Ambient Curing.....412
Amorphous Semiconductors182
ANN366
Annealing121
Antioxidant.....493
Antioxidant Activity476, 531
Areca Sheath Ash (ASA)65
Argon/Oxygen Flow Ratio.....158
AZ913

B

Beams359
Benchmarking279
Benefic Geophagy.....423
Bio-Oil445
Biochar Based Adsorbents459
Biomass Based Adsorbents.....459
Biopolymer.....15
Biosorption.....459
Boron Carbide.....3
Brownian Motion Mobility182

C

Casting9
Ceria130
Cerium Oxide.....254
Characterization9
Clay423
CMOS147
CMR Manganites110
Co-Evaporation189
Comparison485

Composite.....9, 110, 141
Concrete.....311
Conducting Polymers.....141
Conductivity Tensor205
Copper Deposition.....164
Copper Ions.....459
Copper Tin Sulfide189
Corrosion72
Crippling Load.....387
Crystalline.....182
Crystalline Structure164
Cultural Habit423
Cutting Force291
Cutting Parameter291
Cutting Speed.....261
Cylindrical Quantum Wire205

D

DC Magnetron Sputtering.....158
Degradation.....89
Density.....261
Density of States172
DFT212
Diamond298
Digital Light Processing279
Displacement387
Doping147
Double-Gate (DG) MOSFETs.....147
DPPH429, 514
Dragon Fruit.....514
Drug Gels.....54
Dry Milling.....291
Dublet130
Ductility321, 333, 345

E

EBSD43
EDS65
Electroless Coating.....72
Electromagnetic Wave.....205
Enhanced Oil Recovery54
EPR130
Essential Oil.....468, 485
Ethanol.....451
Experiment.....270
Explicit FEA270

F

Fe-Cr Slag Particle	43
Fermentation	476
Ferrofluid	83
Fiber	387
Flavonoid	429, 493
Flexural Properties	21
Fly Ash	311, 366, 376
FMO	212
Free Electron Concentration	182
Free Hole Concentration	182
Friction Stir Spot Weld	241
FTIR	212
FTIR Spectra	141
Fullerene Dendrimer	221

G

Garic	493
GC-MS Analysis	468
Geopolymer	403
Geopolymer Concrete	412
GGBS	311, 321, 345
GGBSCC	396
Glucose	451
Grain Size	33

H

Heterocycles	227
High Calcium Fly Ash	412
High-K Dielectric	147
High Strength Concrete	359
HNTs	21
HOMO/LUMO	227
HVOF Coatings	254
Hydraulic Press	437
Hydro-Distillation	468, 485
Hydroforming	270
Hydrogenation	182
Hydrolysis	451, 514

I

ICF	387
IGZO	182
Impact Energy	21
Incinerated Bio-Medical Waste Ash	321, 345
Intermediate Band Solar Cell	172
Inverse Indeg Invariant	221
Isotherm Magnetoresistance	110
IT Grades	279

J

Jackfruit (<i>Artocarpus heterophyllus</i>)	476
---	-----

K

Kinetics of Drug Release	54
--------------------------------	----

L

L ₉ Orthogonal Array	291
Laser Field	205
Lifetime	89
Limonene	468
Liquid-Liquid Equilibria	445
Liquid Natural Rubber	15
Load-Deflection Behaviour	321, 333, 345
Loss of Ignition (LOI)	65
Losses	89

M

Machining	298
Machu Rumi	423
Magnesium Ferrite	83
Magnesium Metal Matrix Composites	3
Magnetic Flux	83
Magnetic Particles	15
Magnetoresistance	110
Magnetron Sputtering	164
Mangifera Indica	502
Mango	502
Martensitic Stainless Steel	291
Mechanical	15
Mechanical Properties	33
Mechanical Testing	21
Memory	198
Metal Matrix Composite	43, 261
Metallic Disc	270
Micro Hardness	9
Micrograph	423
Microstructure	9
Microwave	502
Microwave Assist Hydrodistillation	485
Minimally Processed Products	531
Morphological Studies	189
Mulliken Charges	227

N

Nanocomposites	43
Nanofiller Doped Polymer Electrolytes	101
Nanoindentation	254
Nanoparticles	83

Nanosilicon Carbide.....	9
Nanostar Dendrimers	221
Nanotechnology	147
Nanotubes.....	221
Neem Oil.....	437
Neem Seed Kernel	437
Ni-P-W	72
Ni-P-ZrO ₂	72
NLO	227
Normal Strength Concrete	359
NRTL	445

O

Optical Band Gap.....	158
Optical Properties.....	101
Optical Studies	189
Optimized Structure	227
Organolead Halide Perovskite	172

P

Parabolic Potential	205
Pasteurize	502
PCE	172
PEO Polymer Electrolytes	101
Peracid.....	72
Photopolymers	279
Phytochemical Screening.....	429
Plasma Etching.....	121
Plastic behaviour.	387
Polyaniline	141
Polymer Dendrimer.....	221
Polymer Gels.....	54
Polyphenol	429, 476, 493, 531
Pomelo(<i>Citrus grandis</i> L.)	485
Pyrazoline.....	227

Q

Quantum Dot.....	172
------------------	-----

R

RCPT	311
Reinforced Geopolymer Concrete	321, 333, 345
Resistive Switching.....	198
Rheology	54, 366
Rice	524
Rice Husk Ash (RHA)	65, 261, 376, 403
Root Cause	89

S

<i>S. platensis</i>	451
Safety Hazard.....	89
Secondary Ion Mass Spectrometer	164
Self Compacting Concrete.....	376
SEM	65, 141, 412
SEM Characterization.....	459
Sewage Sludge.....	524
Sf-Bf/Ep Composites	21
Silicon	147, 182
Stereolithography.....	279
Stir Casting	3, 33
Stress Distribution	241
Structural Studies.....	189
Sugarcane Bagasse.....	445
Superplasticizer.....	366

T

Temperature.....	366
Temperature Distribution.....	241
Ternary Blends.....	376
TGA	15
Thermal Conductivity	83
Thermal Properties.....	101
Thermal Spray Coatings	254
Thermo-Mechanical Simulation	241
Thickness Reduction.....	270
Tiles	403
Torsion.....	359
Toughness	345
Toughness Index.....	333
Transformer Oil	89
Trapped Electron Concentration.....	182
Trapped Hole Concentration.....	182
Treated Sludge Application	524

U

UNIFAC	445
--------------	-----

V

Vietnam Folk Medicine	429
Vitamin C.....	476, 531
VLSI	147

W

Waste Glass Powder	345
Waste Wood Ash	333
Water Binder Ratio	311
WEDM	261
Williamson-Hall	121

Workability412

X

X-Ray Diffraction 110, 121
X-Ray Diffractometer 164
X-Ray Fluorescence 164
XRF 65

Z

ZrO₂ 198