IEI Epitome

Volume 8 | Issue 8 | August 2023

A Century of Service to the Nation

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Notification for IEI R&D Grant-in-Aid

Volume 8 | Issue 8 | August 2023

To promote appropriate technology, assist in building up design & research talents and, most importantly, to help in nurturing potential R&D venture amongst engineering students pursuing Diploma/UG/PG/PhD courses. The Institution of Engineers (India) had instituted the R&D Grant-in-Aid program way back in 2001.

Every year, the Institution invites applications for funding industry-oriented R&D projects and research initiatives aimed at improving the life-style of common people from engineering students pursuing full time Diploma/UG/PG/PhD engineering program in AICTE/UGC/NAAC approved Institutions / Colleges / Universities. The application form and guidelines are available in our website https://www.ieindia.org. The projects should be carried out under the guidance of faculty members who are Corporate Members of IEI. Membership criteria for student(s), guide(s) and institution(s) are as follows:

Project Category	Student/Applicant Membership	Guide(s) Membership	Institutional Membership
1. Diploma	Exempted [Membership of Student Chapter is desirable]	AMIE/MIE/FIE	Not Mandatory
2. UG (BE/BTech/ Equivalent)	'Student Member' (SMIE)	AMIE/MIE/FIE	Applicant's Institute should preferably be an Institutional Member with NBA/NAAC Accreditation or valid NIRF Rank
3. PG (ME/MTech/ Equivalent)	AMIE/MIE/FIE	MIE/FIE	Applicant's Institute should preferably be an Institutional Member with NBA/NAAC Accreditation or valid NIRF Rank
4. PhD	AMIE/MIE/FIE	MIE/FIE	Applicant's Institute should preferably be an Institutional Member with NBA/NAAC Accreditation or valid NIRF Rank

The soft copy of the duly filled-up applications (in editable format), as per the proforma available in our website www.ieindia.org, should be sent through email to research@ieindia.org and one printed copy of the same should reach the following address:

Director (Technical)
The Institution of Engineers (India)
8 Gokhale Road, Kolkata 700 020

Kindly go through the guidelines (visit link: **https://www.ieindia.org/webui/IEI-Activities.aspx#RnD-Initiative**) before filling up the application.

Dr Mohanjeet Singh Syali, FIE
Secretary & Director General
The Institution of Engineers (India), Kolkata
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Dr Mohanjeet Singh Syali was declared eligible for award of the **Doctor of Philosophy** in **Physics** on the thesis entitled '**Gel Polymer Electrolyte Membranes as Superionic Conductors for Electrochemical Applications**' by **Gujarat Technological University**, Ahmedabad on 11 August 2023

Er Ashok Kumar Panda, MIE
Executive Engineer
Military College of Electronics and Mechanical Engineering (MCEME), Secunderabad, Telangana
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Er Ashok Kumar Panda was invited as an esteemed **Speaker** from industry in outreach event for **G20 Digital Innovation Alliance (G20-DIA)** at Software Technology Parks of India, Ministry of Electronics and Information Technology, Government of India at Bhubaneswar on 01 March 2023 .

IEI AWARDS

Call for Papers

The **Steel Authority of India Ltd** (**SAIL**) had instituted two Awards, namely, **SAIL AWARD** and **DR M VISVESVARAYA AWARD** to be given away every year during the **Indian Engineering Congress** to author/s of the articles adjudged best on selected topics. The prize-winning papers will be published in the **Technical Volume of 38th Indian Engineering Congress**. The topics for the year 2023 are given hereunder.

SAIL AWARD

'Beneficiation of Iron Ore — Existing Best Practices / Technologies and Way Ahead'

DR M VISVESVARAYA AWARD

'Improvement in Productivity of Blast Furnaces — Way Forward'

The **Coal India Ltd** (CIL) had instituted an Award to perpetuate the memory of **Late J G Kumaramangalam**, its first Chairman to be awarded every year during the **Indian Engineering Congress** to author/s of the articles adjudged best on a selected topic. The topic for the year 2023 is given below.

Coal India (J G Kumaramangalam Memorial) Award

'Underground Coal Mining — A Green Mining Technology — Challenges & Way Forward'

Intending contributors are requested to send the soft copy of the paper by email to **award@ieindia.org** (with subject heading Paper for SAIL / Dr M Visvesvaraya Award / Coal India (J G Kumaramangalam Memorial) Award and submit four printed copies of their manuscript to:

Director (Technical)
The Institution of Engineers (India),
8 Gokhale Road, Kolkata 700020

Last date of submission: **30 September 2023**

For downloading the template of paper and declaration form, please visit the following link:
https://www.ieindia.org/webui/IEI-Activities.aspx#Call_Papers

Book

Er Mohammad Ashraf Fazili, FIE
Former Chief Engineer
PWD, J&K Government
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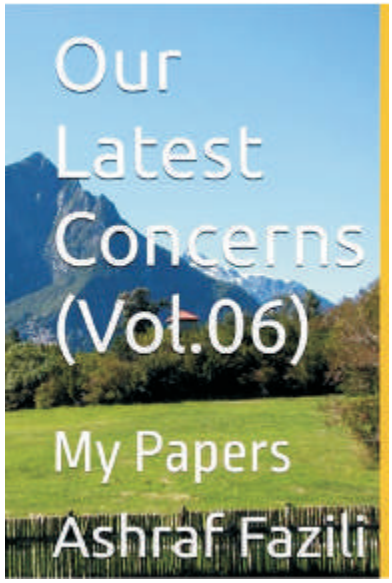
Our Latest Concerns (Vol.06): My Papers



About the Book

The matters of immediate concern presented by the author and discussed in various forums particularly in the Institution of Engineers (India) J&K State Centre for the last five years have been reproduced in this book. In fact, the book is the sixth link of the chain of books forming the collection of papers presented by the author from time to time. The first book was "Our Concern" published in 2003 by I-Proclaim Press USA, followed by Our New Concerns, Engineer's Concern, The Burning Issues - all published at USA and Environment in Jammu & Kashmir published by Gulshan Books Srinagar. The forty topics in this book include Smart Engineering for a better world, Water conservation and management, Skill development during and after the Pandemic, Engineering a response to the COVID-19 Pandemic, About IEI, On plantation drive, Workshop on Project Management, Environment of the earth, Engineering for change, Valuing water, Beat plastic pollution, Evolution of Srinagar-the Sun City, Srinagar master plan-Public Consultation, Suggestions and Comments, Connecting people to nature, 13th anniversary of Kashmir earthquake, Electrical safety and disaster management, Role of Engineers in a developing India, Golden Jubilee of Engineer's day, 51st Engineer's day, Engineering Preparedness for Disaster Management, Air pollution, Traffic improvement of Srinagar city, Sewerage & drainage issues of Srinagar city, Various problems faced by engineers of PWD J&K State, Non-conventional energy resources, A Perfect Solution to Food Waste disposal etc. The challenges faced due to the expanding population and digital revolution need to be addressed to for a smooth peaceful living of mankind. Besides some recent write ups in the local newspapers too have been included for the interest of readers. I am thankful to Mr. Ishfaq Dar for sparing time to retype some of the chapters of the book. It is hoped that the book will serve as a reference book to the interested students of these subjects and as useful information to the general public.

Details:

ISBN	:	9798853871823
Date of Publication	:	December 2022
Publisher	:	Independently published
Sold by	:	Amazon Asia-Pacific Holdings Private Limited

Dr Vivek Kumar Himanshu, AMIE
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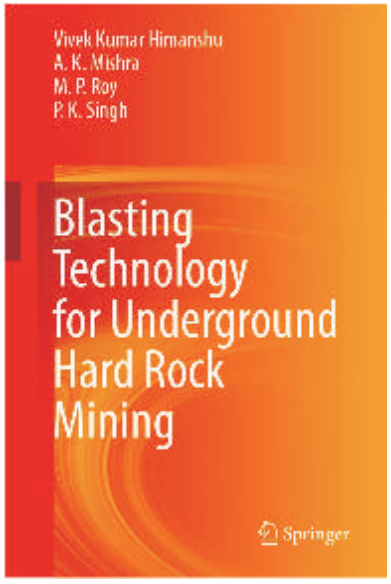
Blasting Technology for Underground Hard Rock Mining

Co-authors: **A K Mishra, M P Roy & P K Singh**



About the Book

This book presents the principles and practices of rock blasting forunder ground hard rock mining. It covers a theoretical background of the rock blasting technology and comprehensive case studies on different stages of rock blasting for underground metalliferous mining. It includes the discussions on burn-cut face blasting pattern,slot raise excavation methodology, and ring blasting methods. It further discusses different practical challenges associated with underground blasting, viz. ore dilution, ground vibration, wall instability, etc., and their possible solutions. The book also covers therecent advancements in methodologies to predict blasting outcomes and instrumentations for monitoring rock blasting operations. Thebook is a useful reference for rock blasting practitioners, mining engineers, professionals, and researchers. It is also a valuable reference for undergraduate and postgraduate students.

Details:

Hardcover ISBN	:	978-981-99-2644-2
eBook ISBN	:	978-981-99-2645-9
Softcover ISBN	:	978-981-99-2647-3
DOI	:	https://doi.org/10.1007/978-981-99-2645-9
Date of Publication	:	31 May 2023
Publisher	:	Springer Singapore

WFEO 2023 Awards – Call for Nominations

The WFEO Secretariat is pleased to advise you that the call for nominations is now open for:

- The 2023 WFEO - GREE Women in Engineering Award
- The 2023 WFEO Medal for Excellence in Engineering Education
- The 2023 WFEO - CCC H. J. Sabbagh Prize for Excellence in Engineering Construction

The combined presentation and nomination forms for each of the above mentioned Awards can be downloaded at http://www.wfeo.org/awards.

The awards are open for nominations by any institution, however nominations sent or supported by WFEO member organizations will be highly regarded.

For all three awards, please note that the deadline for nominating for any of those awards is **22 September 2023**.

Nominations are to be sent only at wfeo-awards@wfeo.org.

The Laureates will be announced at the forthcoming WFEO World Engineers' Convention and General Assembly meetings in Prague, 9-15 October 2023.

The WFEO Secretariat may be contacted at secretariat@wfeo.org for any queries.

Papers published in the Journals / Proceedings ....

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Professor
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Title of Paper: A Novel Simplified Approach in Fabricating TiO_2 Photoanodes for Dye-sensitized Solar Cells

Materials Letters, Elsevier, 349, 2023, Print ISSN: 0167-577X, Online ISSN: 1873-4979

DOI: https://doi.org/10.1016/j.matlet.2023.134730

Co-authors: Mian-En Yeoh, Kah-Yoong Chan, Hin-Yong Wong, Gregory Soon How Thien, Pei-Ling Low, Zi-Neng Ng & H C Ananda Murthy

Abstract: *Globally, the hydrothermal method is widely adopted in synthesizing TiO_2 photoanodes for various applications, including dye-sensitized solar cells (DSSCs). Nonetheless, this method typically involves several synthesis steps, and most reported works were intricate and complex to follow. In this work, a reinvented novel methodology for hydrothermal synthesis was successfully developed. The mixed-phase of anatase-rutile TiO_2 photoanodeswas demonstrated by omitting several intermediate hydrothermal steps. Using the reinvented methodology, the DSSC devices presented a comparable and excellent power conversion efficiency (η = 3.30%) to commercial TiO_2-based DSSCs (η = 3.81%). Hence, this preliminary study provided new perspectives toward simplifying wet chemical synthesis TiO2 techniques for the design structure of DSSCs.*

Keywords: *TiO_2 Photoanodes; Dye-Sensitization; Solar Cells; Hydrothermal Method; DSSC*

Title of Paper: Hydrothermal duration Effect on the Self-assembled TiO_2 Photo-Anode for DSSC Application

Optical Materials, Elsevier, 141, 2023, Print ISSN: 0925-3467, Online ISSN: 1873-1252

DOI: https://doi.org/10.1016/j.optmat.2023.113907

Co-authors: Mian-En Yeoh, Kah-Yoong Chan, Hin-Yong Wong, Pei-Ling Low, Gregory Soon How Thien, Zi-Neng Ng & Hanabe Chowdappa Ananda Murthy

Abstract: *Dye-sensitized solar cell (DSSC) has been extensively researched over the past few decades due to its facile and low-cost fabrication process compared to the silicon solar cell. Generally, the photo-anode of the DSSC consists of a titanium dioxide (TiO_2) film deposited on a transparent conducting oxide (TCO) substrate. Hydrothermal method is the most widely adopted technique for the synthesis of TiO_2 photo-anode. Nevertheless, the optimum hydrothermal synthesis parameters have yet to be elucidated. In this work, the influences of hydrothermal duration on the self-assembled TiO_2 photo-anode were investigated. It was discovered that the rutile content in the TiO_2 photo-anodes can be controlled by adjusting the hydrothermal durations. The highest DSSC efficiency of 3.88% was achieved at an optimum hydrothermal duration of 10 h, corresponding to a rutile content of 80.43%. The improvement in DSSC efficiency can be ascribed to the reduced electron-hole recombination resulting from electron transfer from rutile to anatase lattice trapping sites, thereby improving the photocurrent. However, when the hydrothermal durations exceeded 10 h, the DSSC efficiency dropped due to the agglomeration of the rutile TiO_2 resulted from excessive rutile content, which led to decreased surface area for dye adsorption and hence lower photocurrent. The results suggest the importance of controlling the hydrothermal duration on the synthesis of TiO2 photo-anode.*

Keywords: *TiO_2 Photoanodes; Solar Cells; Hydrothermal duraion Effect DSSC*

Title of Paper: Multielement Doped Barium Strontium Titanate Nanomaterials as Capacitors

Journal of Chemistry, Hindawi, 141, 2023, Print ISSN: 2090-9063, Online ISSN: 2090-9071

DOI: https://doi.org/10.1155/2023/6338649

Co-authors: Kiflom Gebremedhn Kelele, H C Ananda Murthy, Kar Ban Tan, Kah Yoong Chan, Dhanalakshmi Muniswamy, Aschalew Tadesse & Suresh Ghotekar

Volume 8 | Issue 8 | August 2023

Abstract: *Due to the growing demand of energy and wastage of energy, there exists an interest of storing energy so that it could be utilized efficiently. Capacitors are materials designed for such an application. Ferroelectric materials are known for their application as capacitors. Of such materials, perovskites are the preferable classes of materials that have been used as capacitors. Barium strontium titanate nanomaterial is a member of perovskites which encompasses a smaller dielectric loss, elevated dielectric constant, and good thermal stability. Research studies also clarified that incorporating dopants into a barium strontium titanate nanomaterial of high dielectric materials including metal/metal oxides enhances their efficiency and effectiveness. Moreover, multielement doping or codoping has shown better dielectric properties as compared to the unidoping of BST. In this review, barium strontium titanate capacitors codoped with more than one metal/metal oxides have been studied most of which have shown that the codoped barium strontium titanate materials possess improved and sufficient dielectric properties to be utilized as capacitors. We believe that this work will have of its own contribution on understanding the doped barium strontium titanate nanomaterial by clarifying the most probable and detail reasons behind the enhancement of dielectric properties of codoped barium strontium titanate nanomaterials.*

Keywords: *BST; DRAM; Doping; Capacitor; Dielectric Characteristics*

Title of Paper: **Microstructural, Morphological and Dielectric Properties of Mo, Se Co-doped $Ba_{0.6}Sr_{0.4}TiO_3$ Perovskites**

Materials Science for Energy Technologies, Elsevier, 6, 2023, Online ISSN: 2589-2991

DOI: https://doi.org/10.1016/j.mset.2023.02.005

Co-authors: Kiflom Gebremedhn Kelele, H C Ananda Murthy, Aschalew Tadesse & K B Tan

Abstract: *Previous studies have shown that co-doping of BST resulted in enhanced dielectric properties of BST. Meanwhile, no work was reported about effect of Mo, Se on the dielectric properties of Barium strontium titanate (BST). Hence, this report was expected to contribute on the ways of enhancing the dielectric activity of BST through doping. The purpose of the research was to investigate the microstructural, morphological as well as the dielectric properties of BST and Mo, Se co-doped BST following their slow injection sol–gel synthesis and calcined at 800 °C. The effective synthesis of cubic Ba0.6(Sr0.4-xSex)(MoyTi1-y)O3 nanopowder has been confirmed using FT-IR, Raman spectroscopy, EDS, and XRD techniques where the presence of every element and the empirical formula matched with the predicted ones. The average crystallite size of BST increased from 23.97 nm to 26.18 nm after doping. Likewise, the average grain size elevated from 40.13 nm to 53.27 nm accompanied by the elevation of the number of agglomerated crystallites in a grain per SEM particle (1.98 to 3.55). The average particle size of Mo and Se co-doped BST was found as 26.63 nm. The lowering of pore size as well as pore volume of BST was also observed after doping. All these properties led to the elevation of dielectric constant (from 248.8 to 953.00) and lowering of the dielectric loss (from 0.1620 to 0.0928). Therefore, the Mo, Se co-doped BST possessed such varied properties from BST which makes it to be effectively utilized in capacitive applications such as supercapacitors.*

Keywords: *BST; DRAM; Mo-Se Co-doping; Capacitor; Dielectric Characteristics*

IEI Industry Excellence Award 2023

Request for Participation

The IEI Industry Excellence Award has been instituted to recognize industry leaders for their innovation, excellence in engineering operations and thereby, to lead their industry in competitive manner. The benchmarks created by the industries in India have included productivity, quality, safety and performance assurance thereby giving India the rightful place in the global markets. Realizing that such industries can provide the leadership to a large number of other industries in the country, it has been considered appropriate by the IEI Council to institute the IEI Industry Excellence Awards in the year 2008.

Applications in specified format (visit link: ***https://www.ieindia.org/webui/IEI-Activities.aspx#industry-excellence-award***) are invited from prospective applicants for **IEI Industry Excellence Award 2023**. The last date of receipt of application for the Award 2023 is **30 September 2023**.

Interested applicants are requested to send their applications (Two hard copies & One soft copy in Pendrive/CD) to the below mentioned address.

The Director (Technical)
The Institution of Engineers (India), 8 Gokhale Road, Kolkata 700 020

Dr Jitendra Mohan Giri, FIE
HoD
Department of Mechanical Engineering, Lloyd Institute of Engineering and Technology, Greater Noida, Uttar Pradesh
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Title of Paper: A Comprehensive Review of the Energy Efficiency on Nano Coated Fin and Tube Condenser

Environmental Quality Management, Wiley, 2023, Online ISSN:1520-6483

DOI: https://doi.org/10.1002/tqem.22055

Co-authors: Naveenprabhu Venkateswaran, Naveen Subbaiyan, Gopirajan Punniyakotti Varadharajan, Suresh Vellingiri, Abdul Rab Asary & Pitchandi Petchimuthu

Abstract: *The condenser is a piece of equipment used to effectively transfer heat from water to the environment. The fin and tube condenser is the most commonly used in commercial applications. The improved performance of heat transfer in the fin and tube condenser is a significant area of study all over the world because optimizing the efficiency of heat transfer in the condenser will contribute to enhancing the effectiveness of system performance. The vapor deposition, plasma spray, and thermal spray techniques are being used, and it is determined that a heat transfer enhancing coating improves condenser performance. This review discusses the nanomaterial coating over the fin and tube condenser in detail. The various nanomaterial coatings with various propositions and coating methods had been discussed with the evidence of previous researchers. At a 50-degree inclination angle on the condensate plate, the condensate over the coating surface increases by more than 30%. The thermal properties of the working fluid are improved over the condenser, and the overall effectiveness of the condenser is increased by approximately 40% over the non-coated condenser. A 1% volumetric concentration of Nanoparticles in the coated material achieves a maximum efficiency increase of 78.7%.*

Keywords: *Nanomaterials; Surface Coating; Condenser; Heat Exchanger; Performance Characteristics; Fin and Tube*

Title of Paper: A Review Paper of FSW on Dissimilar Materials using Aluminum

Materials Today: Proceedings, Elsevier, 2023, Online ISSN: 2214-7853

DOI: http://dx.doi.org/10.1016/j.matpr.2023.03.304

Co-authors: Sangaraju Sambasivam, Nakul Gupta, Ali saeed jassim, Durgeshwar Pratap Singh, Sandeep Kumar & Manish Gupta

Abstract: *Friction stir welding is an emerging technique to join two materials with each other. Firstly, this technique was developed for aluminum alloys, but now, this technique covers a large area of different or similar metals and polymers to weld. Friction Stir Welding (FSW) is now widely used in the welding process of different industries like railways, aeronautics, and defense. Friction stir welding is a strong joining measure this utilizes a non-consumable apparatus to join two confronting pieces deprived of softening the workpiece material. In this study, Aluminum and its alloy are focused on welding with different materials. Tool design, tool material, rotating speed, welding speed, and tilt angle are the parameters that can affect the FSW of aluminum alloys.*

Keywords: *Aluminum Alloys; Friction Stir Welding; FSW; Speed; Tool Design*

Know-Your- Member (KYM)

The Institution of Engineers (India) is updating the database of all its **Corporate Members** along with their achievements for which a **Know-Your-Member** (KYM) form has been introduced.

Every Corporate Member is requested to kindly fill up the form and forward it along with the self-attested copy of photo ID proof to the address given below:-

The Director (Membership)
The Institution of Engineers (India), 8 Gokhale Road, Kolkata 700020
Email: datamemb@ieindia.org

The form is available on IEI Website:
https://www.ieindia.org/WebUI/ajax/Downloads/WebUI_PDF/HIGHLIGHTS_DOCUMENT-3332.pdf

Dr Ganesh S Kadam, MIE
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Title of Paper: **Water Vapour Cutting Fluid Assisted Productive Machining of Inconel 718**

Materials and Manufacturing Processes, 2023, Print ISSN: 1042-6914 Online ISSN: 1532-2475

DOI: https://doi.org/10.1080/10426914.2023.2190389

Co-author: Raju S Pawade

Abstract: *High-speed turning of Inconel 718 has been assessed with coated carbide tooling incorporating the minutely explored eco-friendly cutting fluid as water vapour. Effect of total seven parameters, viz. nozzle diameter, stand-off distance, pressure, flowrate, cutting speed, feedrate and depth of cut, has been explored for the resulting machined surface quality in terms of surface roughness and surface alterations; additionally introspection of chip reduction ratio has been done to evaluate cooling/lubrication mechanics of water vapour at tool-work interface. The parameters of stand-off distance, cutting speed, feedrate and depth of cut were dominantly affecting the surface roughness with their contributions being 9.70%, 22.70%, 20.85% and 34.47% respectively. By increasing nozzle diameter, stand-off distance and pressure, around 13.28%, 16.47% and 8.82% reduction in surface roughness is possible respectively on account of enhancement of cooling and lubrication effect; however conversely increasing the cutting speed brought around 40% increment in surface roughness.*

Keywords: *Machining; Turning; Ecofriendly; Surface; Roughness; Cutting; Fluids; Inconel*

IEI Industry Excellence Award for Start Up Initiatives

Request for Participation

The engineering sector is experiencing remarkable growth with Government and private funding, presenting immense commercial potential on a global scale. Technology and innovation are the driving forces behind a vibrant MSME ecosystem, with start-ups acting as a perennial source of inspiration.

We cordially invite **start-up organizations** in Engineering, Consultancy Services, Construction, Healthcare, Utility Services, IT & Telecommunication, and related domains to apply for the prestigious IEI Industry Excellence Award 2023. To be eligible, applicant organizations must be duly registered with DPIIT, IN-SPACe, ISRO, Ministry of MSMEs, Government of India, and relevant State Industrial Development Corporations.

The IEI Industry Excellence Award 2023 aims to recognize and celebrate innovative start-ups that demonstrate exceptional promise and positive impact on society. By participating in this prestigious award, you not only stand a chance to gain industry recognition but also open doors to new opportunities, partnerships, and potential investors.

To participate, submit your applications using the specified format available at ***https://www.ieindia.org/webui/IEI-Activities.aspx#industryexcellence-award***. The application deadline is **30 September 2023**.

Send two hard copies and one soft copy (Pen drive/CD) to:

The Director (Technical)
The Institution of Engineers (India), 8 Gokhale Road, Kolkata 700 020

We eagerly await your participation in this celebration of ingenuity and entrepreneurship.

Volume 8 | Issue 8 | August 2023

Er Ebin P M, AMIE
Assistant Professor
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Title of Paper: Identification of Pneumonia Symptoms in Covid19 Patients using Transfer Learning Approach

2023 International Conference on Computer Communication and Informatics (ICCCI), IEEE, 2023, Electronic ISBN: 979-8-3503-4821-7, Print on Demand (PoD) ISBN: 979-8-3503-4822-4, Electronic ISSN: 2473-7577, Print on Demand (PoD) ISSN: 2329-7190

DOI: https://doi.org/10.1109/ICCCI56745.2023.10128630

Co-author: B Kaimal Athira

Abstract: *Over 1 million individuals were impacted globally by the COVID 19 epidemic, which also claimed over 10 lakh lives. As a result of the Covid 19 infection, pneumonia might develop, putting the patient in danger of serious illness or even death. Therefore, it is crucial to recognize the signs of pneumonia and its existence in Covid 19 patients. The VGG16 architecture is a Deep Learning architecture that was the first runner-up in the 2014 visual recognition challenge. The researchers are applying transfer-learning to detect the presence of pneumonia in this case. Chest X-ray scans from kaggle, a publicly accessible open dataset, served as the study's data set. The model's accuracy was 95.83%, and a comparison with various other models was also presented.*

Keywords: *Covid19; Deep Learning; Transfer Learning; VGG16; X-Ray Images*

IEI Industry Excellence Award for Overseas Organizations

Request for Participation

Discover IEI:

Welcome to The Institution of Engineers (India) or IEI – your gateway to engineering excellence and worldwide collaborations. With strong ties to esteemed international bodies, IEI stands as a beacon of innovation on the global stage. For more details, visit www.ieindia.org.

Introducing the IEI Industry Excellence Award:

To recognize industries' crucial role in shaping society and the economy, IEI instituted these awards in 2008. They honor remarkable innovation, excellence in engineering operations, and unwavering commitment to high standards.

Join Us in Celebrating Excellence:

We take immense pride in the global industrial achievements – productivity, quality, safety, and performance assurance that have earned industries a significant place worldwide. At IEI, we firmly believe that industry leaders like you hold the key to shaping a brighter future on a global scale.

Why Participate?

- Elevate Your Status: Gain national and international acclaim for your exceptional achievements.
- Lead the Charge: Set new excellence standards and inspire industries worldwide.
- Unlock Opportunities: Forge invaluable connections with like-minded global leaders.
- Champion the Profession: Participate and uphold engineering's prestige and integrity.

How to Participate: Visit ***https://www.ieindia.org/webui/IEI-Activities.aspx#industry-excellence-award*** and apply easily. Be part of a global celebration of engineering brilliance! The application deadline is **30 September 2023**.

Join the Prestigious Ranks: Don't miss the chance to shine on the world stage. Unleash your organization's potential and celebrate engineering excellence with us.

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Title of Paper: Electrosorption of Hexavalent Chromium Ions by MnO_2/Carbon Fiber Composite Electrode: Analysis and Optimization of the Process by Box-Behnken Design

Iraqi Journal of Chemical and Petroleum Engineering, IJCPE, 24(1), 2023, pp 51–63, EISSN: 2618-0707, PISSN: 1997-4884

DOI: https://doi.org/10.31699/IJCPE.2023.1.7

Co-authors: Zainab M Issa & Rasha H Salman

Abstract: *A nano manganese dioxide (MnO_2) was electrodeposited galvanostatically onto a carbon fiber (CF) surface using the simple method of anodic electrodeposition. The composite electrode was characterized by field emission scanning electron microscopy (FESEM), and X-ray diffraction (XRD). Very few studies investigated the efficiency of this electrode for heavy metals removal, especially chromium. The electrosorption properties of the nano MnO_2/CF electrode were examined by removing Cr(VI) ions from aqueous solutions. NaCl concentration, pH, and cell voltage were studied and optimized using the Box-Behnken design (BDD) to investigate their effects and interactions on the electrosorption process. The results showed that the optimal conditions for the removal of Cr(VI) ions were a cell voltage of 4.6 V, pH of 2 and NaCl concentration of 1.5 g/L. This work indicated that MnO_2/CF electrode was highly effective in removing Cr(VI) ions and the BBD approach was a feasible and functional method for evaluating the experimental data.*

Keywords: *Electrosorption Process; Hexavalent Chromium Ions; Composite Electrode; Electrodeposition; Nanostructured MnO_2; Box-Behnken Design*

IEI Engineering Education Excellence Award 2023

Request for Participation

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Title: **A Mathematical and Experimental Approach to Improve Strength and Corrosion Resistance of Gas Tungsten Arc, Electron Beam and Friction Stir Welded AA2219-T87 Al-Alloy**

Authors: **B Rajnaveen, G Rambabu, K Prakash & K Srinivasa Rao**

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DOI: https://doi.org/10.1007/s40033-022-00368-4

Publication date: 04 July 2022

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Title: **A Study on the Mechanical Properties of Rare Earth-based Aluminium Composite**

Authors: **K Balamurugan, T Deepthi, Ananda Kumar Subramanian, Amit Banerjee, Daksh Agarwal, Arindam Biswas & Arijit Sinha**

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Title: **A Study on the Evolution of Structural and Optical Properties in the Thermally Evaporated Ag_2Te Thin Films**

Authors: **Shubhendra Gupta, Mukesh Kumar Gupta, Dinesh C Sharma, Mukesh Kr Chowrasia & M K Banerjee**

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Title: **An Experimental Study on Bulge Test of Commercially Pure Aluminium Sheet Metal**

Authors: **Sandeep Kumar Paral & Abhishek Mandal**

Mechanical Engineering Department, Jadavpur University, Kolkata, India

DOI: https://doi.org/10.1007/s40033-022-00386-2

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Title: **Analysis of Dielectric Relaxation in Sodium Silicate (Na_2SiO_3) using Complex Impedance Spectroscopy**

Authors: **Sudhangshu Chakraborty**
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DOI: https://doi.org/10.1007/s40033-022-00383-5
Publication date: 10 August 2022
Pages: 45–50

Title: **Analysis of Stress Through the Thickness of Hybrid Laminated Nanocomposites using Finite Element Method**

Authors: **Mriganan Madhab Bordoloi, Sushen Kirtania, Sanjib Banerjee & Satadru Kashyap**
Department of Mechanical Engineering, Tezpur University, Assam, 784028, India

DOI: https://doi.org/10.1007/s40033-022-00380-8
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Title: **Analysis of Various Machine Learning Algorithms for Cast Aluminium Alloy to Estimate Fatigue Strength**

Authors: **Vedant Shrikant Utpat & Swanand Gajanan Kulkarni**
SKN Sinhgad College of Engineering Korti Pandharpur, Solapur, India

DOI: https://doi.org/10.1007/s40033-022-00381-7
Publication date: 25 July 2022
Pages: 61–70

Title: **Application of the Standardized Injury Rate (SIR) Concept to Determine the Accident/ Injury Proneness of Underground Hard Rock Mine Workers**

Authors: **Falguni Sarkar & Sakshi Kumari**
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DOI: https://doi.org/10.1007/s40033-022-00379-1
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Pages: 71–86

Title: **Assessment of Work Postures and Physical Workload of Machine Operators in Underground Coal Mines**

Authors: Vikram Sakinala, P. S. Paul & Shyamal Chandrakar
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DOI: https://doi.org/10.1007/s40033-022-00389-z
Publication date: 30 August 2022
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Title: **Comparison of the Experimental and Modelling Results of Mechanical Characteristics of LM6 and LM9 Alloy for Tractor Application**

Authors: **Chetan C. Shetteppanavar, Rohan Bhausaheb Shinde, Harish Hanumanthappa, G. T. Mohanraj, Bharath Kumar Shanmugam Sudarshan, Shobharani Krishnameena Yashaswini Srivatsav & Aishwarya Rathna Brindha Kavitha Kumar**
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Pages: 99–106

Title: **Design of Dump Slope on Weak Foundation**

Authors: **Harshal Verma, Eeswara Sai Chaitanya Kumar Rudra, Rajesh Rai, K. Athiveera Pandian & Bappaditya Manna**
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Pages: 107–118

Title: **Development and Implementation of Innovative Approaches to Fixing Wells in Difficult Conditions**

Authors: **A. O. Ihnatov, Jamil Haddad, Ye. M. Stavychnyi & M. M. Plytus**
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DOI: https://doi.org/10.1007/s40033-022-00402-5
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Pages: 119–130

Title: **Effect of Blaine Number on the Physical and Mechanical Properties of Iron Ore Pellets**

Authors: **Deepak Kumar Gorai, Shaik Saida, Kapil Dev Mehta & Binod Kumar Singh**
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Title: **Effect of Nano-Filler Aluminum Oxide and Graphene on Flammability Properties of Kenaf Epoxy Composites**

Authors: **Amreen Taj, R. P. Swamy, Kishan Naik & K. N. Bharath**
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Title: **Effect of Silicon Addition on Erosion-Corrosion Characteristics of High-Tensile Brasses**

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Authors: **Sumalatha Boddu, G. Kavitha, John Babu Dulla, Venkata Narayana Alugunulla & Subbaiah Tondepu**
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Title: **Enhanced Mechanical Properties of Metal filled 3D Printed Polymer Composites**

Authors: **D. L. Vinay, R. Keshavamurthy & Vijay Tambrallimath**
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Title: **Estimation of Filling Property of Cast Al–Si–Mg Alloy**

Authors: **Samavedam Santhi, Jhansi Jadav, P. V. S. L. Narayana, Bhomik K. Deogade & U. S. Jyothi**
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DOI: https://doi.org/10.1007/s40033-022-00391-5
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Title: **Evolution of Nusselt Correlation for Recovery of Waste Heat from Industry Flue Gases using Quarry Dust and Iron Ore Particles**

Authors: **Pramod Kaki & Ashok Kumar Popuri**
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Title: **Evolution of Residual Stresses in Friction Stir Welded Joints of AA7039**

Authors: **Gaurav Chauhan, Mrinal Sahu, Pyla Prasad, Somnath Bhattacharya & Subhas Ganguly**
Department of Metallurgical and Materials Engineering, National Institute of Technology, Raipur, 492010, India
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Title: **Experimental and Numerical Analysis of Pressure Gradient and Flow Characteristics of Cemented Paste Backfill Based on Carbonate-Rich Tailings**

Authors: **Sandeep Panchal, Debasis Deb & T. Sreenivas**
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Title: **Experimental Studies on the Mechanical Behaviour of Three-Dimensional PLA Printed Parts by Fused Filament Fabrication**

Authors: **Pushpendra Yadav, Ankit Sahai & Rahul Swarup Sharma**
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Title: **Exploring Possibilities for Fabricating Cu–TiB2 Composite Through Different Powder Metallurgy Routes**

Authors: **Uttam Kumar Murmu, Shrishty Sahu, Abhishek Ghosh & Manojit Ghosh**
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Authors: **R. Soundararajan, A. Sathishkumar, L. Feroz Ali & K. Kaviyarasan**
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Title: **Friction and Wear Characteristics of Coconut Shell Ash and Titanium Dioxide-Reinforced Al6061-Based Hybrid Composites**

Authors: **K. S. Hemanth Kumar, B. Siddeswarappa, Prasanna P. Kulkarni & Kiran Kumar Rokhade**
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Title: **Introduction of Safe Noise Zone (SNZ) Concept to Minimize the Adverse Effects of Noise during Jumbo Drilling Operation in Indian Underground Metalliferous Mines**

Authors: **Falguni Sarkar, Sunil Kumar Bisoyi, Pritismita Behera & Debashis Roy**
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Title: **Numerical Analysis of Joule Heating in a Ni–Ti Segmented Wire used in Sensing Applications**
Authors: **Tareq Ahmed Farooqui, Vinod Belwanshi, Kedarnath Rane, Kiran Suresh Bhole & Sachin Oak**
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Pages: 301–308

Title: **Numerical Simulation of Bimorph Piezoelectric Beam with Circular Holes**
Authors: **Rajiv Ranjan Singh, Deepak Kumar & Manikant Paswan**
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Authors: **Harshal Verma, Rajesh Rai, Bhanwar Singh Choudhary & Bappaditya Manna**
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Title: **Optimization of Wear Properties of B4C Nanoparticle-Reinforced Al7075 Nanocomposites Using Taguchi Approach**
Authors: **G. Anil Kumar, J. Satheesh, K. V. Shivananda Murthy, H. M. Mallikarjuna, N. Puneeth & Praveennath G. Koppad**
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Title: **Removal of Cadmium Metal using a Novel Material Corncob: Characteristics and Kinetics Study**
Authors: **Bangaraiah Pagala**
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Title: **Temperature-Dependent Wear Behavior of Air Plasma Sprayed Alumina and Alumina–Titania Composite Coatings**

Authors: **S. Sunil Kumar, K. Mahesha, K. B. Sachidananda & Arjun Dey**
Department of Mechanical Engineering, Acharya Institute of Technology, Bengaluru, 560107, India
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Pages: 351–357

Title: **Ventilation Air Requirement for Mass-Production Panels (MPPs) in Indian Coal Mines: A Critical Appraisal**

Authors: **Kunal Das, Devi Prasad Mishra & Ram Madhab Bhattacharjee**
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Pages: 359–371

Title: **Workability Studies on Al6061 Alloy and Al6061 Metal Matrix Composites Reinforced with Silicon Carbide Particles Under Cold Backward Extrusion**

Authors: R. Venkatesh, C. A. Niranjan, S. Srinivas & T. Raghavendra
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Title: **Critical Analysis of Tandem Dragline Performance in Open Cast Coal Miness- A Case Study**

Authors: **Vikram Seervi, Nilesh Pratap Signh, Nawal Kishore & Amit Kumar Verma**
Department of Mining Engineering, IIT (BHU), Varanasi, 221005, India

DOI: https://doi.org/10.1007/s40033-022-00393-3
Publication date: 16 September 2022
Pages: 391–402

Title: **Fabrication and Applications of 2D Few-Layer Antimonene: An Overview**

Authors: **Adil Wazeer**
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DOI: https://doi.org/10.1007/s40033-022-00387-1
Publication date: 16 August 2022
Pages: 403–412

Title: **Nanomaterials Synthesis via Laser Ablation in Liquid: A Review**

Authors: **Adil Wazeer, Apurba Das, Arijit Sinha & Amit Karmakar**
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Title: **Trifluorosulfonyl Imide-Based Ionic Liquid Electrolytes for Lithium-Ion Battery: A Review**
Authors: **Nandan Nag, Chaitanya Sharma, Ankit Singh, B. N. Roy, Sumit K. Sharma & Amit Kumar**
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Title: **Evaluation of Damage Area on Low-Velocity Impact Tested AA3003 Sandwich Panels Using Digital Image Analysis: A Novel Method**
Authors: **R. S. Jayaram, S. Senthil Murugan, P. V. Prasanth & M. John Iruthaya Raj**
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Title: **A Novel Study of Synthesis, Characterization and Erosion Wear Analysis of Glass–Jute Polyester Hybrid Composite**
Authors: **Abhilash Purohit, Janaki Dehury, Laxmi Narayan Rout & Satyaranjan Pal**
Mechanical Engineering Department, Synergy Institute of Engineering and Technology, Dhenkanal, 759001, India
Mechanical Engineering Department, VSSUT, Burla, 768018, India
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Publication date: 17 March 2023
Pages: 1-9

Title: **Biohydrogen Production from Enzymatically Digested Cotton Stalks Using Citrobacter freundii**
Authors: **Rajendran Lakshmidevi & Karuppan Muthukumar**
Department of Biotechnology, Sri Venkateswara College of Engineering, Pennalur Village, Sriperumbudur, Tamilnadu, India
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Pages: 11–18

Title: **Cathodoluminescence Studies of Europium, Dysprosium and Eu, Dy Co-doped YVO4 Nanophosphor**
Authors: **H. J. Rajendra & C. Pandurangappa**
Department of Physics, RNS Institute of Technology, Channasandra, Bengaluru, 560098, India
DOI: https://doi.org/10.1007/s40034-022-00260-6
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Pages: 19–27

Title: **Comparative Study of Defluoridation of Water Using Green Synthesized Zirconia Nanoparticles and Zirconia–Graphene Oxide Nanocomposite**
Authors: **Poornima G. Hiremath, Nagaraju Ganganagappa, Udayabhanu, Sujay S. Suresh, Sushmitha Sajjan & Rishitha K. Nanjundappa**
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Title: **Comparative Study on Application of Capric Acid and Stearic Acid as Thermotropic Phase Change Material (PCM) for Imparting Thermo-Regulation Properties on Cotton Fabric**
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Publication date: 28 December 2022
Pages: 37–49

Title: **Design and Development of Wound Dressing by Using Commercial Antiseptic Liquid**
Authors: **Subrata Ghosh, Kaliraj Balasubramaniam & Prasanta Das**
Department of Textile Technology, Dr. B. R. Ambedkar National Institute of Technology, Amritsar GT Road Bypass, Jalandhar, Punjab, 144011, India
DOI: https://doi.org/10.1007/s40034-022-00256-2
Publication date: 28 December 2022
Pages: 51–60

Title: **Effect of Various Dyeing Procedures on Hand Behaviour of Polyester Shirting Fabrics**
Authors: **Mukesh Kumar Singh & B. K. Behera**
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Department of Textile & Fibre Engineering, Indian Institute of Technology Delhi, New Delhi, 110016, India
DOI: https://doi.org/10.1007/s40034-022-00248-2
Publication date: 08 November 2022
Pages: 61–72

Title: **Effect of Yarn Linear Density on Static and Dynamic Mechanical Properties of Jute Yarn Reinforced Epoxy Composites**
Authors: **Manu Aggarwal & Arobindo Chatterjee**
Department of Textile Technology, Dr. B.R. Ambedkar National Institute of Technology Jalandhar, Jalandhar, 144027, India
DOI: https://doi.org/10.1007/s40034-023-00266-8
Publication date: 23 January 2023
Pages: 73–81

Title: **Enhanced Productivity of Fragrance Compounds: Biotransformation of D-limonene Using Whole Cell Immobilization of Pseudomonas putida and Rhodococcus erythropolis**
Authors: **Shweta Kashid, Kalpana Joshi, Shweta More, Atmaja Shinde & Sanjay Nene**
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Innovation Biologicals Private Limited, NCL Innovation Park, Dr. Homi Bhabha Road, Pashan, Pune, 411008, India
DOI: https://doi.org/10.1007/s40034-022-00252-6
Publication date: 31 October 2022
Pages: 83–93

Title: **Facile Synthesis, Characterization, and Photocatalytic study of La2O3/SnO2 Nanocomposites**
Authors: **Manoj Kumar & Atikur Rahman**
Department of Metallurgical and Materials Engineering, National Institute of Technology Srinagar, Hazratbal, Srinagar, 190006, India
DOI: https://doi.org/10.1007/s40034-023-00267-7
Publication date: 18 March 2023
Pages: 95–108

Title: **Human Factor Analysis of Textile Industry Workers Using Various Ergonomic Assessment Tools**
Authors: **S. Senthil Murugan, S. Ponraja, D. Shyamprasad Varma & M. John Iruthaya Raj**
Department of Mechanical Engineering, Rajalakshmi Engineering College, Chennai, 602105, India

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Department of Mechanical Engineering, Mar Ephraem College of Engineering and Technology, Marthandam, India
DOI: https://doi.org/10.1007/s40034-022-00255-3
Publication date: 05 January 2023
Pages: 109–117

Title: **Improving the Quality of Rice Husk Biochar Through Combined Pretreatment of Rice Husk and Copyrolysis with LDPE**

Authors: **Prakash Binnal, S. P. Manjunath, G. D. Vani & Pranay Sharma**
Department of Chemical Engineering, Siddaganga Institute of Technology, Tumkur, Karnataka, 572103, India
National Thermal Power Corporation, New Delhi, India
DOI: https://doi.org/10.1007/s40034-022-00261-5
Publication date: 28 December 2022
Pages: 119–128

Title: **Investigating the Effect of Compression Ratio on Operating Characteristics of Compression Ignition Engine Fueled with Diesel—Ricebran Biodiesel—n-Butanol Additive Blends**

Authors: Rajendra Pawar, Sharad Patil & Dattatray Hulwan
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Department of Mechanical Engineering, Vishwakarma Institute of Technology, Pune, India
DOI: https://doi.org/10.1007/s40034-022-00264-2
Publication date: 02 January 2023
Pages: 129–140

Title: **Isolation of Nanocellulosic Fibrils from Allium cepa L. Skin Biowaste Food Residues: Extraction and Characterization**

Authors: **Deepshikha Datta, Divakar Pamanji & Bimal Das**
Department of Chemistry, Brainware University, Barasat, West Bengal, 700125, India
Department of Chemical Engineering, GMR Institute of Technology, Rajam, 532127, India
Department of Chemical Engineering, National Institute of Technology, Durgapur, 713209, India
DOI: https://doi.org/10.1007/s40034-022-00259-z
Publication date: 28 December 2022
Pages: 141–151

Title: **Natural Dyes in Combination: Dual Dyeing for Newer Shades by Varying Pre-treatments, Mordants and Type of Natural Dyes**

Authors: **Dhara Shukla, Archana Gangwar & Padma S. Vankar**
Indian Institute of Technology, Kanpur, India
Bombay Textile Research Association, Mumbai, India
DOI: https://doi.org/10.1007/s40034-022-00251-7
Publication date: 25 October 2022
Pages: 153–164

Title: **Production of Biodiesel Using Immobilised Rhizopus oryzae Lipase in a Microchannel Reactor**

Authors: **Natarajan Yasvanthrajan, Pandian Sivakumar, Karuppan Muthukumar & Arunagiri Appusamy**
Department of Chemical Engineering, National Institute of Technology, Tiruchirappalli, Tamil Nadu, 620015, India
School of Energy Technology, Pandit Deendayal Energy University, Gandhinagar, Gujarat, 382426, India
DOI: https://doi.org/10.1007/s40034-022-00257-1
Publication date: 01 December 2022
Pages: 165–170

Title: **The Effect of Hydrogen Peroxide on Composite Lapping of Titanium Alloy (TC4) by Free Abrasive Assisted Fixed Abrasive**

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Authors: **Zhankui Wang, Yakun Yang, Shiwei Wang, Minghua Pang, Yongfeng Li & Jianxiu Su**
School of Mechanical and Electrical Engineering, Henan Institute of Science and Technology, Xinxiang, 453003, Henan, China
School of Information Engineering, Henan University of Science and Technology, Luoyang, 471000, Henan, China
DOI: https://doi.org/10.1007/s40034-022-00254-4
Publication date: 13 October 2022
Pages: 171–183

Title: **Treatment of Kitchen Wastewater in a Batch Electrochemical Reactor**
Authors: **V. S. Neeraj, A. Arunangiri & K. Muthukumar**
Department of Chemical Engineering, National Institute of Technology, Tiruchirapalli, 620015, India
DOI: https://doi.org/10.1007/s40034-022-00262-4
Publication date: 30 December 2022
Pages: 185–194

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Sl. No.	Name of the Course	Scheduled Dates
1.	Operation, Maintenance and Quality Assurance of High-pressure valves and Heat Exchangers	04 - 06 Sep 23
2.	Flexible Pavements and Overlays-Design, Construction and Maintenance	04 - 08 Sep 23
3.	Network Administration: Configuring & Securing LANs and WANs	04 - 08 Sep 23
4.	Creative Leadership and Leading High-Performance Teams for Organizational Development (Innovative and Inspiring Leadership Methodologies with Case studies and Role plays)	04 - 07 Sep 23
5.	Water Pollution Monitoring & Modelling using Software Applications - Theory & Practical's	05 - 07 Sep 23
6.	Critical Minerals & Elements: Exploration, Mining & Sustainability	06 - 08 Sep 23
7.	Disciplinary Proceedings	06 - 07 Sep 23
8.	Advances in Design & Optimization of UAV's for Industrial Applications (Defence, Mining & Construction)	11 - 14 Sep 23
9.	Big Data Analytics for Business Decisions (Hands-on practical on MS Excel & Tableau)	11 - 14 Sep 23
10.	NDT Level II Certification in Ultrasonic Technique in Accordance with ASNT Document No. SNT-TC-1A 2011	11 - 15 Sep 23
11.	Hydro Turbines, Governing & its Protection Systems	11 - 14 Sep 23
12.	Surface Engineering - Concepts, Applications and Emerging Technologies	12 - 15 Sep 23
13.	Information Security Policies & Security Audit	12 - 14 Sep 23
14.	Operation, Maintenance & Testing of Power Transformers and HT Circuit Breakers	12 - 15 Sep 23
15.	Application of Bio- Engineering Technologies for Waste Water Treatment in Nalas, Drains And Canals	13 - 15 Sep 23
16.	Soil & Water Conservation : Importance and Best Practices	11 - 13 Sep 23
17.	Teambuilding, Motivation and Leadership Skills for Improving Organizational Performance at Mount Abu	16 - 18 Sep 23
18.	Agroecology and organic farming	20 - 22 Sep 23
19.	Sanitation and Waste Management	20 - 22 Sep 23
20.	Power Cables Selection, testing, Laying and Commissioning	20 - 22 Sep 23
21.	Contract Management and Dispute Resolution in Engineering Projects	25 - 29 Sep 23
22.	Engineering Design using CREO-Parametric	25 - 27 Sep 23
23.	Competency Based Performance Management Systems (PMS) and Strategies (for HR Scientists, Managers and Executives)	25 - 28 Sep 23
24.	Advanced Blasting Techniques in Opencast Mines to Mitigate Undesirable Effects	25 - 29 Sep 23
25.	Micro grids - Smart Grids Issues & Challenges	25 - 27 Sep 23
26.	Industry 4.0, Quality Aspects	25 - 28 Sep 23
27.	Training on Data science & Machine Learning at Coorg	25 - 27 Sep 23
28.	Water Governance - Challenges and the way forward	26 - 28 Sep 23
29.	Preparation of bid documents and Procurement of sewerage schemes	27 - 29 Sep 23

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