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International Transactions on Electrical Energy Systems / Volume 31, Issue 5 / e12833

RESEARCH ARTICLE

Efficient energy management of hybrid renewable energy sources-based smart-grid system using a hybrid IDEA-CFA technique

Bapayya Naidu Kommula ✉, Heqing Song, Liang Chen, Chunxiang Xu

First published: 08 March 2021
https://doi.org/10.1002/2050-7038.12833

Summary

A hybrid technique-based energy management scheme for optimal sizing of solar, wind, battery along the integral of pumped hydro storage (PHS) is presented in this paper. The suggested control scheme is the consolidated implementation of both Improved Dolphin Echolocation Algorithm (IDEA) and Cuttlefish Algorithm (CFA). Searching behavior of Dolphin Echolocation Algorithm (DEA) is changed through utilizing productive search capacities such as levy flight, so it is known as IDEA. The prominent intension of this work is the optimal energy management in between the source side as well as load side also the total cost function minimization through the suggested IDEA-CFA control procedure. In the proposed work, the IDEA joined with CFA develops the appraisal approach for setting specific control signals to the system as well as generating control signals to disconnected path in subject to power assortment in between the source side as well as load side. Based on equality as well as inequality constraints, the objective function is classified by system data. The suggested model is implemented at MATLAB/Simulink work site as well as execution will be evaluated along the present strategies. The annualized cost and lifetime of HRES considering the system component with capital cost, operation and maintenance cost, replacement cost and lifetime are analyzed. The system component such as PV, Wind, BESS, water pump, water turbine, and upper reservoir are analyzed. The capital cost, operation and maintenance cost, replacement cost and lifetime of PV are 865 [$/kW], 18 [$/year], 865 [$/kW], and 25 [year].

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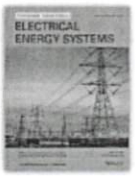

Volume 31, Issue 5
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/10.1002/2050-7038.12833

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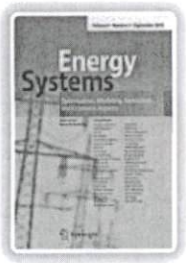

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An efficient integration and control approach to increase the conversion efficiency of high-current low-voltage DC/DC converter

P. Rajesh, Francis H. Shajin & Bapayya Naidu Kommula

Energy Systems (2021)

Abstract

In this manuscript, to increase the conversion efficiency of high current low voltage bidirectional DC/DC converter is proposed. The proposed converter uses switched inductor and switched coupled mutual inductance in the proposed system. Here, the switched inductor is an impedance network consists of split inductors and switches, which provides the high voltage conversion ratio and improves the output power quality that need for the low voltage applications. It also used as a filter to circulate the high frequency switching harmonics. In the proposed circuit, leakage current and power loss of mutual inductance is decreased because of soft switching. Thus the proposed method helps to reduce the switching loss, possibly low electro magnetic interference (EMI) and easier thermal management. This is used in the

DC-DC converter for dynamic performance enhancement of hybrid AC/DC microgrid. Electronics **9**(10), 1653 (2020)

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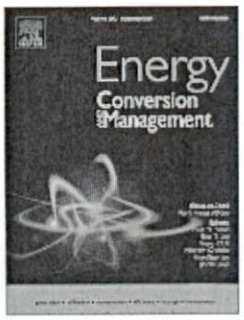

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Experimental investigation of strategies to enhance the homogeneous charge compression ignition engine characteristics powered by waste plastic oil

Parthasarathy, M. [a], Ramkumar, S. [a], Elumalai, P.V. [b], Sachin Kumar Gupta [b], Krishnamoorthy, R. [c], Mohammed Iqbal, S. [d], Santosh Kumar Dash [b], Silambarasan, R. [e]

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Highlights

- • Developed HCCI Engine powered by waste plastic oil (WPO) and compared with conventional CI engine.
- • Inlet air temperature (IAT) and injection pressure (IP) of WPO were optimized for the HCCI engine.
- • Increase in IP higher than 10 bar resulted in preignition of the fuel.
- • NOx and smoke emissions drastically reduced for HCCI mode as compared to conventional CI engine.
- • HCCI engine performance optimized for 90 °C IAT and 8 bar IP.

Abstract

In the present-day scenario, the regulations over vehicle emissions are highly stringent, and the manufacturers are struggling to satisfy the emission norms. Waste plastic oil (WPO)

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Energy Conversion and Management
Volume 236, 15 May 2021, 114026

Experimental investigation of strategies to enhance the homogeneous charge compression ignition engine characteristics powered by waste plastic oil

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Received 16 December 2020, Revised 16 December 2020, Accepted 4 March 2021, Available online 31 March 2021, Version of Record 31 March 2021.

https://doi.org/10.1016/j.enconman.2021.114026

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Research Article

Effect of Cerium Oxide Nanoparticles to Improve the Combustion Characteristics of Palm Oil Nano Water Emulsion using Low Heat Rejection Engine

P.V Elumalai, M. Murugan, A. Saravanan &

a Department of Mechanical Engineering, Aditya Engineering College, Surampalem, India

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Feb 2021, Published online: 13 Apr 2021

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ABSTRACT

Biodiesel plays an important role in the automotive sector due to the enormous demand for conventional fuels such as diesel. A significant drawback of utilizing conventional fuel in the base engine is tailpipe emissions. The addition of water into the fuel reduced the harmful pollutants emitted from the engine and improved engine performance. The palm oil was used as biodiesel and it was mixed with 5% (by volume)

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P.V Elumalai, M. Parthasarathy, M. Murugan, A. Saravanan & C. Sivakandhan

Pages 1482-1496 | Received 05 Dec 2020, Accepted 16 Feb 2021, Published online: 13 Apr 2021

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ABSTRACT

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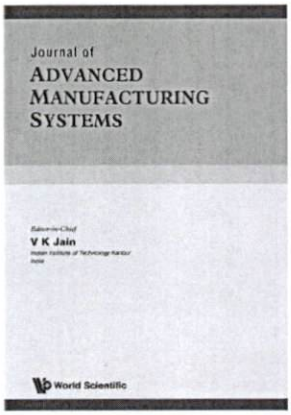

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Influence of Various Pulse Waveforms during Fabrication of Micro Rectangular Pattern by Masked Tool using Electrochemical Micromachining

S. Kunar*,‡ and B. Bhattacharyya†
*Mechanical Engineering Department
Aditya Engineering College, Surampalem, India
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Jadavpur University, Kolkata, India
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Maskless electrochemical micromachining (EMM) is an alternative method to fabricate microsurface textures on conductive substances, but it is still very challenging issue to create microsurface textures by this method. This paper proposes a new issue that maskless EMM process generates micro rectangular patterns using various pulse waveforms i.e. triangular, sine and square of pulsed DC power supply at constant voltage mode on stainless steel (SS-304) workpiece. A novel concept of maskless EMM setup consisting of EMM cell, electrode holding devices, electrical connections and vertical cross flow electrolyte system is introduced for the generation of high-quality micro rectangular patterns using various pulse waveforms. Another important finding is that SU-8 2150 negative photoresist can fabricate more than 28 micro rectangular patterned samples with higher dimensional accuracy and surface quality. The influence of machining voltage, inter electrode gap, pulse frequency, duty ratio and flow rate is investigated on machining performance such as length overcut, width overcut, machining depth and surface roughness (R_a) of micro rectangular pattern using three pulse waveforms. One mathematical model is developed to show the effectiveness of three pulse waveforms by the estimation of current efficiencies. From the experimental investigation, it is observed that higher frequency with square waveform at constant duty ratio is suitable to generate high-quality micro rectangular patterns under pulsed DC power supply.

Keywords: Maskless EMM; microsurface texture; micro rectangular pattern; pulse waveforms; reused masked tool; machined characteristics.

1. Introduction

Electrochemical micromachining (EMM) is a noncontact type advanced micromachining process in which material is removed from a textured workpiece in controlled manner through the electrochemical anodic dissolution in an electrolyte. Fabrication of microsurface textures is an effective approach on some microproducts, which are more functional like improved heat transfer efficiency, enhanced tribological performance, reduced wettability, etc.[1] EMM is a suitable method for the

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International Journal of Pattern Recognition and Artificial Intelligence | Vol. 35, No. 05, 2150015 (2021) | Pattern Recognition

Modeling a Virtual Bare-Hand Interface System Using a Robust Hand Detection Approach for HCI

Songhita Misra, G. Sridevi and R. H. Laskar

https://doi.org/10.

Department of ECE, Aditya Engineering College, Surampalem, India

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Abstract

A practically deployable gesture recognition system is developed using a robust hand detection method implemented using a motion-based image segmentation process and a two-level bare hand classification model, which is integrated with a gesture classification system of 58 gestures using new robust features. Since detection of bare hand is affected by nonideal conditions, multiple color-texture features are analyzed in this study. In the second stage of the system, 18 new ASCII characters are introduced and analyzed along with the existing 40 characters (alphabets, numbers, and arithmetic operators). New 15 dimensional features are introduced along with the existing features to enhance the classification accuracy of the gestures. Significance of features statistically tested using one-way analysis of variance (ANOVA), Kruskal–Wallis and Friedman test, which

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IMPROVING DATA AGGREGATION EFFICIENCY USING MULTI-LAYER APPROACH IN IoT

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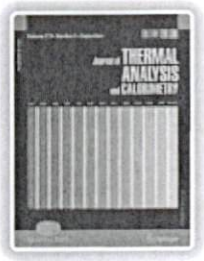
Abstract - Recently, tremendous growth and interest in the deployment of tiny sensors in the Internet of Things (IoT) for smart applications improves human lives. With the increasing need for energy-efficient mechanisms in IoT communication, the data aggregation technique for reducing data transmissions is considered a significant research problem. The basic idea in most of the aggregation mechanisms is to build the clustering or aggregation tree in an application layer over IoT, resulting in high complexity. To solve such a problem, the proposed MLDA designs an energy-aware aggregation layer that focuses on utilizing the network layer factors in data aggregation by providing transparency of accessing the topology structure from the network layer. Moreover, the proposed work also focuses on the design of the load-balanced topology structure in the network layer for efficient routing and also takes support from such network structure for energy-efficient data aggregation. The proposed Multi-Layer based Data Aggregation approach (MLDA) avoids the hotspot problem and inefficient data aggregation. The MLDA achieves such goals by improving the network layer protocol, RPL activities and designing the aggregation layer to eliminate redundant transmissions. By using an energy-efficient network structure, the impact of redundant data transmissions on network resources and data aggregation efficiency are eliminated. To support SUM, AVG, MAX, and MIN aggregation functions without redundant data transmissions, the Double Hash Bloom Filter (DHBF), observation scheme, and merge sort are used in the developed aggregation layer. Thus, the proposed MLDA improves the data aggregation efficiency in terms of both energy and accuracy.

Keywords: IoT; data Aggregation; RPL; redundant Data Transmission; Multi-layer approach

1. Introduction

There is a growing interest in deploying the Internet of Things (IoT) in various smart applications. With the deployment of a huge number of smart devices and their applications, gathering and analyzing the data is becoming one of the main challenges [Dehkordi, *et al*(2020)]. As the tiny sensor devices are powered by batteries, energy-efficient operations are critical in IoT applications [Karamitsios, and Orphanoudakis, (2017)]. Large scale and dense IoT network creates a tradeoff between the waste of energy due to data redundancy and maintaining the data aggregation efficiency. The data aggregation scheme has to lessen the redundant readings of sensors in the surrounding area [Chandnani, and Khairnar, (2020)][Wala, et al (2020)].

The data aggregation efficiency is largely dependent on the network topology. Thus, the support from lower layers, especially from the network layer is essential to improve the data aggregation efficiency without wasting the energy of sensor devices. It necessitates the importance of a multi-layer data aggregation approach [Guimaraes, *et.al* (2019)]. However, there is a lack of providing load balanced and an energy-efficient topology structure in the network layer, thereby improving the data aggregation efficiency. Mapping the network topology structure to the aggregation activities is crucial. However, it increases the network cost when connecting the non-adjacent layers, such as the network and application layer via messages. Thus, the proposed work plans to integrate the aggregation layer upper to the network layer. Before transferring the received data to the gateway, It is desirable for a parent node in the aggregation layer to eliminate redundancies in the received data from the neighboring nodes and to aggregate the data effectively. Thus, the proposed MLDA plans to take a network layer support in creating the load-balanced DODAG structure in RPL and eliminates the redundant transmissions significantly to improve the data aggregation efficiency without wasting the network resources.



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Evaluation of water emulsion in biodiesel for engine performance and emission characteristics

P. V. Elumalai, M. Parthasarathy, V. Hariharan, J. Jayakar & S. Mohammed Iqbal

Journal of Thermal Analysis and Calorimetry **147**, 4285–4301 (2022)

Abstract

The present experiment was conducted by executing detailed tests on performance, combustion, and emission characteristics to prove that the Nerium biodiesel emulsified fuel can be an eco-friendly fuel. The emulsified biodiesel was formed by mixing with a small proportion of water in the limits of 5%, 10%, and 15% by volume. This study also assessed the stability of different emulsified blends. The properties were tested according to ASTM requirements. The blend of 60% diesel, 20% biodiesel, 15% water, and 5% surfactant showed the higher brake thermal efficiency and in-cylinder pressure by 13.72% and 12.6%, respectively, when related to base fuel. Also, carbon monoxide, oxides of nitrogen, opacity of smoke and hydrocarbon emission of the above blend decreased by 42.87%, 6.5%, 12.96%, and

nano emulsion in low heat rejection engine. Heat Mass Transfer. 2021. https://doi.org/10.1007/s00231-021-03028-7.

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Shaik Khader Basha ✉ P. S. Ranjit b Department of Mechanical Engineering, Aditya Engineering College, Surampalem, India du Ravi Kumar

Received 09 Aug 2020, Accepted ... Apr 2021, Published online: 12 May 2021

Abstract

In the present scenario, the world economy is developed by modernisation and mechanisation by balancing the use of renewable energy sources rather than non-renewable energy sources. The fossil fuels derived from non-renewable sources are costly and polluting the environment, which has driven to search for better alternative fuels. The present experimentation investigates the influence of blending of Neem seed biodiesel (NSOB) with diesel along with supplementation of compressed natural

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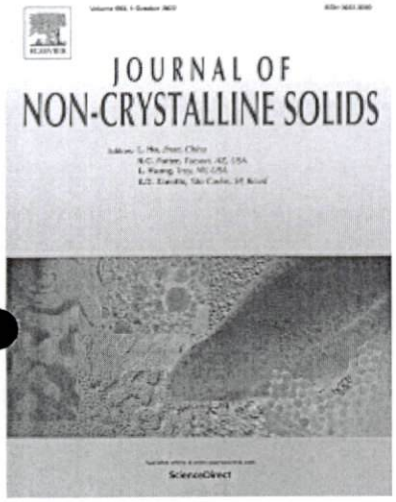
Download citation https://doi.org/10.1080/01430750.2021.1923568 Check for updates

Abstract

In the present scenario, the world economy is developed by modernisation and mechanisation by balancing the use of renewable energy sources rather than non-renewable energy sources. The fossil fuels derived from non-renewable sources are costly and polluting the environment, which has driven to search for better alternative fuels. The present experimentation investigates the influence of blending of Neem seed biodiesel (NSOB) with diesel along with supplementation of different blends of NSOB added to conventional diesel from 10% to 30% with 10% increment and CNG was inducted through the



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The role of Sm_2O_3 on the structural, optical and spectroscopic properties of multi-component ternary borate glasses for orange-red emission applications

S. Hemalatha [a], M. Nagaraja [a], A. Madhu [b], K. Suresh [c], Srinatha N [d]

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Received 14 September 2020, Revised 4 December 2020, Accepted 4 December 2020, Available online 5 January 2021, Version of Record 5 January 2021.

https://doi.org/10.1016/j.jnoncrysol.2020.120602

Abstract

This paper reports, Sm^{3+}-doped Sodium-Zinc-Borate glasses have been prepared by the melt-quenching method and the influence of samarium concentration on their structural, optical and spectroscopic properties. The findings of X-ray diffraction and Raman demonstrate that the glasses were non-crystalline and amorphous glassy nature. The optical findings show the non-linear variation of indirect energy band gap with Sm^{3+} concentration. Spectroscopic intensity parameters and radiative properties of Sm^{3+} ions were evaluated by performing Judd-Ofelt theoretical calculations. The emission cross-section (σ_{em}) of various transitions were calculated using Futchbauer-Ladenburgh theory by means of the radiative parameters. The decay curves exhibit non-exponential behavior after 0.5 mol % Sm^{3+} doping, which were analyzed using Inokuti-Hirayama model. Also, 45 % quantum efficiency was attained for 0.5 mol% Sm^{3+} doped glasses. From the investigated luminescence studies, 0.5 mol% of Sm^{3+} doped glass demonstrates the maximum emission intensity in the orange-red region as evidenced from the CIE colour coordinates diagram. The findings show that the prepared glasses are appropriate for orange-red emission applications.

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Yield response of Okra to different row spacings and fertilizer application methods under drip irrigation system

V.V. Tejaswini[1], *K. Sai Manogna[2], N. V. Deekshithulu[3] and K. Sindhuja[4]

[1&2] Department of Applied Engineering, Vignan Foundation For Science and Technology, Vadlamudi 522 213
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(Received 2 July, 2020; Accepted 18 December, 2020)

ABSTRACT

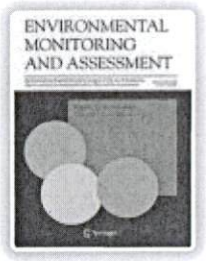
An experiment was conducted to study the okra yield response (*Abelmoschus esculentus* L. Moench) to the different methods of fertilizer application (i.e through fertigation tank and by manual application) & row to row spacing during February-May 2017. Two row spacings of 40x60 cm and 50x60 cm were selected. Analysis of the data showed that the response of the okra crop was considered a better combination of 50 x 60 cm through fertigation method compared to manual application. Yield in plot III was observed to be 22% more compared to manual application under same row to row spacing. Yield attributes such as pod weight, pod length and pod perimeter was also observed to be best in spacing of 50 x 60 cm. Similarly plant characteristics namely plant height, root depth and lateral distribution of roots were also found to be highest in 50 x 60 cm by fertigation method.

Key words : Yield, Row to row spacing, Fertigation, Pod perimeter

Introduction

Water and land resources are the primary needs of agriculture and economic development in any country. The need for these resources will continue to grow due to the increasing population. The world population is growing rapidly than the food supply. India has only 2.4% of the world's landmass and 4% of its freshwater resources. However, it is necessary to support 17.31% of the country's population, which is growing at an startling rate of 2% per year since independence. Agriculture sector consumes around 70 to 80% of available water. Water is perceived as an essential resource for livelihoods, food security and environmental sustainability. If sufficient water resources are available, the intensity of cultivation can be increased to 300% and above, and large areas of fallow land can be brought under arable land,which will solve the problem of food insecurity for a growing population..

In the current context of limited availability of surface water and depletion of groundwater resources day by day the only alternative is to use pressurized irrigation systems, i.e. drip or sprinkler irrigation systems, to meet the food security of a growing population and increasing the arable land by utilizing the limited water resources judicially . In micro-irrigation system, water is injected directly into the root zone of the plant through a network of main lines, submains and lateral lines with emission



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Published: 01 December 2021

Understanding the microstructure, mineralogical and adsorption characteristics of guar gum blended soil as a liner material

Anandha Kumar Subramani, Sujatha Evangelin Ramani & Rangabhashiyam Selvasembian

Environmental Monitoring and Assessment **193**, Article number: 855 (2021)

Abstract

Guar gum blended soil (GGBS) offers potentially advantageous engineering characteristics of hydraulic conductivity and strength for a soil to be used as a liner material. Characterization techniques such as X-ray diffraction, X-ray fluorescence, Fourier transform infrared spectroscopy and scanning electron microscope were used to examine the mineral composition, functional groups and morphological changes in the unblended soil (UBS) and GGBS. These characterization approaches are used to understand adsorption-associated mechanisms of Pb(II) removal. Batch adsorption tests were performed to evaluate the adsorption capacity of UBS and the GGBS with various proportions (0.5%, 1.0%, 1.5% and 2.0%) of guar gum (GG) towards the removal of Pb(II) ions. Batch adsorption experiments were

613401, Tamil Nadu, India. The authors thank the Vice-Chancellor of SASTRA for the support and infrastructure provided during the period of the study.

Funding

This work was supported by the TRR fund [TRR18] from the SASTRA Deemed University, Thanjavur, 613401, Tamil Nadu, India.

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ijlpr 2020; doi 10.22376/ijpbs/lpr.2021.11.1.L102-106

International Journal of Life science and Pharma Research

Review Article

Biotechnology

Strategies for Tracking Immune Surveillance of Tumor Milieu during Angiogenesis

Praveen Kumar Vemuri[1*], Greeshma Nimmagadda[1], Sreedhar Bodiga[2], Vijaya Lakshmi Bodiga[3], Suryanarayana Veeravilli[4] and KRS Sambasiva Rao[5]

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[4]*Department of Humanities and Basic Sciences, Aditya Engineering College, Kakinada, Andhra Pradesh, India*

[5]*Mizoram University (A Central University), Aizawl, Mizoram, India.*

Abstract: Cancer is a multi-stage, multi-mechanistic, multifactorial complex process that has excessive potential for excessive proliferation with no relation to the physiological organ. Inherited genetic inclinations contribute extensively to about 10 % of breast cancers and about 13 % of colon cancers incidences. In the industrialized countries, 7% of most cancer deaths result from viral infections; 4% from occupational hazards; 2% from sunlight; 2% from air, water, and soil pollution; and less than 1% from diet and lifestyle. Formation of new blood vessels, angiogenesis, is elicited by tissue hypoxia and is essential for normal course of development of every tissue and organ. Angiogenesis unequivocally promotes tumor growth and metastasis. Tumors exhibit different rates of pathological angiogenesis and involve not only abnormally proliferating cancer cells, but also various tumor-infiltrating leukocytes and stromal cells. Local milieu of the cancers polarizes the leukocytes to support the tumor growth further. Although conventional knowledge reveals that immune surveillance helps to suppress tumor development, unresolved immune mechanisms including chronic inflammation can promote growth and progression of tumors. In this review, we outline the immune cells and their derived factors, including immunosuppressive and inflammatory cytokines that either can promote or inhibit cancer development, and the role of tumor microenvironment in this process of regulation. In the present review, the role of T-lymphocytese, NK cells, antibody dependent cell cytotoxicity, tumor escape mechanisms are presented.

Keywords: Angiogenesis, Cancer, Carcinogen, Milieu, Metastasis, Tumor

***Corresponding Author**

Praveen Kumar Vemuri , Department of Biotechnology, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Andhra Pradesh, India.

Recieved On 13 May 2020
Revised On 12 June 2020
Accepted On 04 July 2020
Published On 03 January 2021

Funding This research did not receive any specific grant from any funding agencies in the public, commercial or not for profit sectors

Citation Praveen Kumar Vemuri1*, Greeshma Nimmagadda1, Sreedhar Bodiga2, Vijaya Lakshmi Bodiga3, Suryanarayana Veeravilli4 and KRS Sambasiva Rao5 , Immune surveillance of tumor milieu during angiogenesis.(2021).Int. J. Life Sci. Pharma Res.11(1), 102-106 http://dx.doi.org/10.22376/ijpbs/lpr.2021.11.1.L102-106

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https://doi.org/10.1007/s10098-021-02058-3

ORIGINAL PAPER

An experimental investigation on the combustion characteristics of a direct injection diesel engine fuelled with an algal biodiesel and its diesel blends

Nabam Hina Papu[1] · Pradip Lingfa[1] · Santosh Kumar Dash[2]

Received: 4 September 2020 / Accepted: 18 February 2021

Abstract

Conscientious efforts by researchers established that microalgae have huge potential for future energy production. Microalgae strain *Euglena sanguinea* has been collected locally and cultivated in a photoautotrophic mode. The microalgae lipid is extracted from the biomass and subsequently, biodiesel (BD) has been prepared for diesel engine experimental investigation. The main objective of the present study was to analyze various combustion characteristics of underutilized *E. sanguinea* BD in an agricultural diesel engine. Combustion performance of *E. sanguinea* biodiesel and its five different diesel–biodiesel blends (ES10, ES20, ES30, ES40, and ES50) have been studied at different engine loading conditions (0–100%). At full load, ignition delay (ID) reduced by 12.04% for ES100, 8.43% for ES50 and 7.22% for ES40. Combustion duration gradually drops up to ES40 and after that it increases marginally as biodiesel (BD) dosage increases in the blend. Peak cylinder pressure (PCP) and mean gas temperature (MGT) increases with an increase in algae BD concentration in the blend. Net heat release rate (NHRR) and rate of pressure rise (RPR) decrease with an increase in the algal BD concentration in the blend. At full load, PCP and MGT of ES100 (58.11 bar and 1204.84 °C) was 3.03% and 4%, respectively, higher than diesel fuel (56.4 bar and 1160.42 °C). Peak NHRR and maximum RPR of ES100 (43.10 J/°CA and 4.8 bar/°CA) was 12.07% and 10.61%, respectively, lower than diesel fuel (49.02 J/°CA and 5.37 bar/°CA). Overall, microalgae *E. sanguinea* biodiesel/diesel fuel blend up to 40% (ES40) is recommended for regular use in diesel engines.

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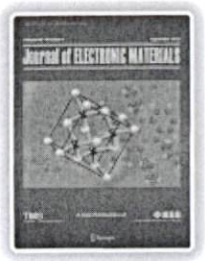
Published online: 11 March 2021



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Linear and Nonlinear Optical Properties of CuO NPs for Photonics

N. R. Dhineshbabu & R. Vettumperumal

Journal of Electronic Materials 50, 3668–3675 (2021)

Abstract

The optical properties of various nanomaterials make them quite interesting and play a vital role in the fabrication of devices used in the optoelectronic and photonic fields. The research community around the world is curios to understand the physical phenomena behind such nanomaterials. In this study, copper oxide (CuO) nanoparticles (NPs) were prepared by a sonochemical method and their detailed optical properties analyzed by ultraviolet–visible (UV–Vis) spectroscopy. The normal dispersion of the refractive index of the CuO NPs was illustrated by the Wemple–DiDomenico single-oscillator method to yield the oscillator strength, static refractive index, dispersion energy (E_d), energy of effective dispersion oscillator (E_o), carrier concentration, and N/m^* values. In addition, nonlinear optical parameters such as the refractive index, third-order nonlinear susceptibility, and optical polarization were also estimated. The nonlinear optical performance of the CuO NPs was

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On behalf of all authors, the corresponding author states that there is no conflict of interest.

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Design of Automated Visual Inspection System for Beverage Industry Production Line

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https://doi.org/10.18280/ts.380225

Received: 12 November 2019
Accepted: 20 February 2021

Keywords:
automated visual inspection system, coverage industry production line, visual inspection, image processing

ABSTRACT

This paper provides an overall design and implementation perspective of a laboratory-scale automated visual inspection system for the beverage industry's production line. A case study has been undertaken where the image processing algorithm inspects the beverage bottle for any defects. Different defects such as improper labeling and improper liquid level can be detected using the image processing algorithm. A laboratory prototype of the conveyor belt has been built, and a prototype filling plant has been established to verify the simulation results.

1. INTRODUCTION

Quality inspection of the finished product is a significant challenge in the production process of an industrial manufacturing plant. A multistaged inspection comprising of different parts, sub-parts, sub-assemblies, and final products is required to improve the finished product's quality and reliability in a mass production facility. Visual inspection of the finished product quality is the industry's norm because using visual inspection, a functional defect or a cosmetic defect can be ascertained easily. A human-based visual inspection system is slow, erratic, expensive, and less accurate. Therefore, the modern manufacturing industry focuses on automated visual inspection systems using high-end imaging devices and high-power processing platforms [1].

A review of the industrial vision system can be found in the studies [2-8]. Figure 1 presents the flow of product in an assembly line where the raw material is converted to a finished product in different steps, and after the finished product is available, a set of the inspection system is initiated to inspect the quality of the finished product. Once the quality of the finished product is ascertained, then it is packed and dispatched to the market.

Visual inspection system can have four types of inspection, such as:

- Inspection of dimensional quality
- Inspection of surface quality
- Inspection of correct assembling
- Inspection of accurate or correct operation

Designing an automated visual inspection system is complicated as it requires multiple high-resolution cameras with high-speed capturing and processing facilities. Dedicated illumination and optical system play a vital role in the automated visual inspection system. Multiple vision platforms are used for the inspection of the different features of the finished product. Every vision platform comprises multiple camera and illumination sources used for image acquisition and image processing. For image acquisition, geometric camera calibration is one of the essential steps. Camera parameters include intrinsic, extrinsic, and distortion coefficients.

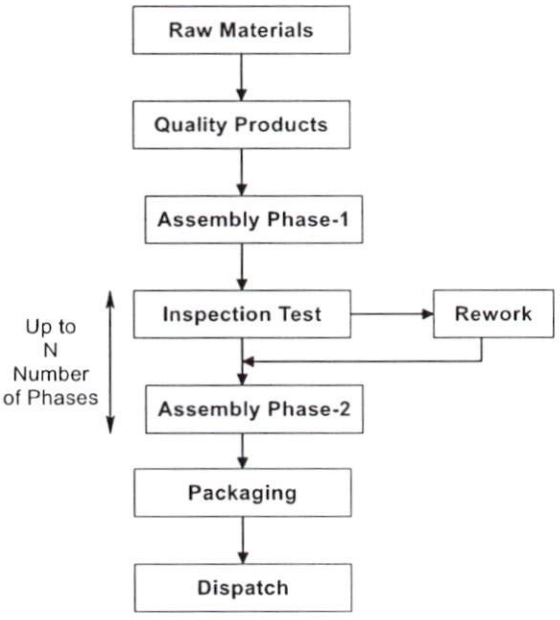

Figure 1. Flow of product in an assembly line

Pinhole camera model and lens distortion model of camera calibration is widely used [9, 10]. Machine vision-based can-end inspection system has been discussed by Chen et al. [11] and vision inspection system for beer bottle has been discussed by Duan et al. [12]. Feature extraction for fill level and bottle cap inspection in the bottling machine has been proposed by Yazdi et al. [13]. Vision-based liquid particle inspection of pharmaceutical injection has been proposed by Zhang et al. [14]. A vision-based system for empty bottle inspection has been reported by Huang et al. [15]. Saliency detection and

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IDEALS OF TRANSITIVE BE-ALGEBRAS

M. Bala Prabhakar, S. Kalesha Vali and M. Sambasiva Rao

Communicated by Ayman Badawi

MSC 2010 Classifications: Primary 03G25.

Keywords and phrases: BE-algebra, filter, ideal, semi-ideal, congruence, homomorphism.

Abstract. The notion of ideals is introduced in transitive BE-algebras. Some characterization theorems of ideals of transitive BE-algebras are derived. The notion of semi-ideals is introduced and studied a relationship between semi-ideals and ideals. Properties of ideals are studied with the help of homomorphisms and congruences.

1 Introduction

The concept of BE-algebras was introduced and extensively studied by H.S. Kim and Y.H. Kim in [6]. The class of BE-algebras was introduced as a generalization of the class of BCK-algebras of K. Iseki and S. Tanaka [5]. Some properties of filters of BE-algebras were studied by S.S. Ahn and Y.H. Kim in [1] and by B.L. Meng in [7]. In [10], A. Walendziak discussed some relationships between congruence relations and normal filters of a BE-algebra. In [9], P. Sun investigated homomorphism theorems via dual ideals of BCK-algebras.

In this work, the notion of ideals is introduced in transitive BE-algebras as a generalization of special type of down sets in many algebraic structures. Some necessary and sufficient conditions are derived for a non-empty subsets of BE-algebras to become ideals. The concepts of semi-ideals and strong semi-ideals are introduced and then some relations among these sets of ideals are studied. Some properties of ideals are derived in terms of homomorphisms and congruences.

2 Preliminaries

In this section, we present certain definitions and results which are taken mostly from the papers [1], [2], [3], [6], [7]and [8] for the ready reference.

Definition 2.1. [6] An algebra $(X, *, 1)$ of type $(2, 0)$ is called a BE-algebra if it satisfies the following properties:

(1) $x * x = 1$,
(2) $x * 1 = 1$,
(3) $1 * x = x$,
(4) $x * (y * z) = y * (x * z)$ for all $x, y, z \in X$.

A BE-algebra X is called *self-distributive* if $x * (y * z) = (x * y) * (x * z)$ for all $x, y, z \in X$. A BE-algebra X is called *transitive* if $y * z \leq (x * y) * (x * z)$ for all $x, y, z \in X$. Every self-distributive BE-algebra is transitive. A BE-algebra X is called *commutative* if $(x * y) * y = (y * x) * x$ for all $x, y \in X$. We introduce a relation $\leq$ on X by $x \leq y$ if and only if $x * y = 1$ for all $x, y \in X$. If X is commutative, then the relation $\leq$ is a partial ordering on X.

Theorem 2.2. [7] *Let X be a transitive BE-algebra and $x, y, z \in X$. Then*

(1) $1 \leq x$ *implies* $x = 1$,
(2) $y \leq z$ *implies* $x * y \leq x * z$.

Definition 2.3. [6] A non-empty subset F of a BE-algebra X is called a filter of X if, for all $x, y \in X$, it satisfies the following properties:

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Received: August 15, 2020
Accepted: December 29, 2020

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Original Article | Published: 17 March 2021

Investigation of TIG Cladding of NiTi Wire on Substrate 304L to Study the Effect of Applied Current on Microstructure and Mechanical Properties

Pramod Kumar ✉, Amar Nath Sinha, Chetan Kumar Hirwani, Akhilesh Kumar Singh, Piyush Kumar Pathak, M. Murugan & A. Saravanan

Transactions of the Indian Institute of Metals **74**, 1333–1348 (2021)

Abstract

NiTi wire of 1 mm diameter was deposited on austenitic stainless steel (304L) for surface property modification using the tungsten inert gas (TIG) cladding process. The study shows that the microstructure and mechanical properties of the NiTi cladding are governed by TIG process parameters, namely TIG current. The micro-hardness of the NiTi clad region has improved 4.7 times compared to the substrate material 304L. The wear resistance of the clad layer against the abrasive disc (Al_2O_3) shows up to 6 times improvement than the substrate material austenitic stainless steel 304L. The presence of Ti-rich (Ni,Fe)Ti, NiTiFeCr and intermetallics, responsible for high hardness and high wear resistance, has

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Original | Published: 29 January 2021

Investigation on the mitigation of environmental harmful emissions by incorporating nanoparticles to biofuel water nano emulsion in low heat rejection engine

P.V Elumalai, C Sivakandhan, M Parthasarathy, S Mohamed Iqbal & M Arunkumar

Heat and Mass Transfer **57**, 1235–1250 (2021)

Abstract

The quantity of energy consumers in the country is extensive in the current quick-moving situation; the whole car industry puts a significant part in energy utilization. Biofuels have lured consideration among other alternative fuels as indicated by their natural element and synthetic creation.In this test, the aluminum nanoparticles are prepared by three various proportions (50, 100 and 150 ppm) being used in the base engine. To introduced thermal

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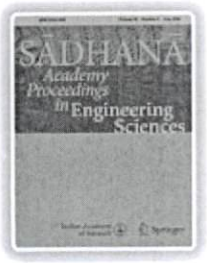

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Published: 30 April 2021

Study of microstructure and mechanical properties of NiTi wire cladding on super austenitic stainless steel 904L by TIG cladding process

Pramod Kumar, Amar Nath Sinha, A Saravanan, M Murugan & Chetan Kumar Hirwani

Sādhanā **46**, Article number: 91 (2021)

Abstract

NiTi wire coating was preplaced on super austenitic stainless steel (904L) for enhancing the surface mechanical property. Melting of NiTi wire of 1 mm diameter formed a clad track on the 904L stainless steel substrate using the TIG cladding process. The influence of TIG current on microstructure, phase formation, micro-hardness and abrasive wear resistance characteristics of the clad surface have been investigated. The maximum average micro-hardness of the NiTi clad layer was 952HV at current of 40 A which is 5.95 times greater than the substrate material 904L. The EDS and XRD study of the NiTi coating layer confirmed the formation of NiTi, NiTi2, and B2 (NiTiFeCr) structure as major constituent phases and some intermetallic (Cr-Fe-

41 Lima M M, Godoy C, Modenesi P J, Avelar-Batista J C, Davison A and Matthews A 2004 Coating fracture toughness determined by Vickers indentation: an important parameter in cavitation erosion resistance of WC–Co thermally sprayed coatings. *Surf. Coat. Technol.* 177: 489–496

Acknowledgements

This research work was supported by Indian Institute of Technology Kharagpur and Aditya College of Engineering and Technology. Mechanical and microstructure characterization was performed at Indian Institute of Technology Kharagpur.

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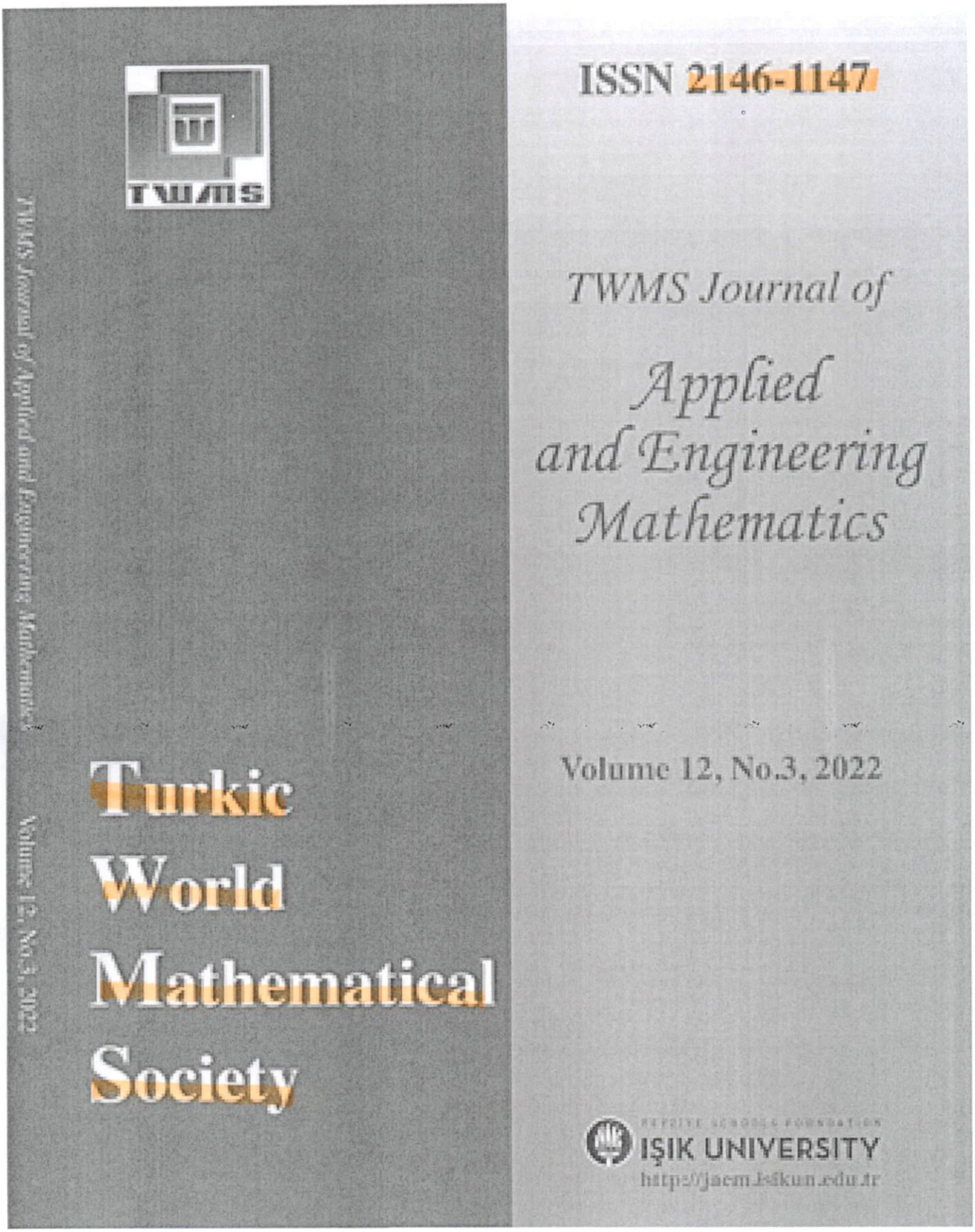

TWMS J. App. and Eng. Math. V.11, N.4, 2021, pp. 1023-1035

REGULAR FILTERS OF COMMUTATIVE BE-ALGEBRAS

V. V. KUMAR[1], M. S. RAO[2], S. KALESHA VALI[3], §

Abstract. The concept of regular filters is introduced in commutative BE-algebras. The class of all regular filters of a commutative BE-algebra is characterized in terms of dual annihilators. Some equivalent conditions are derived for every filter of a commutative BE-algebra to become a regular filter. Some properties of prime regular filters of a commutative BE-algebra are investigated.

Keywords: Commutative BE-algebra; regular filter; minimal prime filter; prime regular filter.

AMS Subject Classification: 03G25.

1. Introduction

Y. Imai and K. Iséki introduced two classes of abstract algebras: BCK-algebras and BCI-algebras [8]. It is known that the class of BCK-algebras is a proper subclass of the class of BCI-algebras. In [5, 6] Q. P. Hu and X. Li introduced a wide class of abstract algebras: BCH-algebras. They have shown that the class of BCI-algebras is a proper subclass of the class of BCH-algebras. J. Neggers and H. S. Kim [12] introduced the notion of a d-algebra which is a generalization of BCK-algebras, and also they introduced the notion of a B-algebra [13, 14], i.e., (I) $x*x = 0$; (II) $x*0 = x$; (III) $(x*y)*z = x*(z*(0*y))$, for any $x, y, z \in X$, which is equivalent in some sense to the groups. Moreover, Y.B. Jun, E.H. Roh and H.S. Kim [9] introduced a new notion, called an BH-algebra, which is another generalization of $BCH/BCI/BCK$-algebras, i.e., (I); (II) and (IV) $x * y = 0$ and $y * x = 0$ imply $x = y$ for any $x, y \in X$.

The notion of BE-algebras was introduced and extensively studied by H.S. Kim and Y.H. Kim in [10]. These classes of BE-algebras were introduced as a generalization of the class of BCK-algebras of K. Iseki and S. Tanaka [7]. Some properties of filters of

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§ Manuscript received: September 20, 2019; accepted: November 21, 2019.
TWMS Journal of Applied and Engineering Mathematics, Vol.11, No.4

Electrical, Optical, and Reliability Analysis of QD-Embedded Kesterite Solar Cell

Publisher: IEEE

G. S. Sahoo ; S. Routray ; K. P. Pradhan ; G. P. Mishra All Authors

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Abstract:

Quantum engineering in kesterite solar cells reveals a blending advancement keeping in mind that copper–zinc–tin–sulfide (CZTS)-based material requires high-research implementation as a replacement for CIGS materials. In this article, a quantum-dot-embedded kesterite solar cell is proposed, in which $CZTS_xSe1-_x$ and CZTS are taken as dot and barrier, respectively, with different sulfur (S) and selenium (Se) content. Focus is given on the incorporation of quantum dots (QDs) and a detailed investigation is carried out through optical and electrical performance, which shows the uniqueness of this study. Quantum efficiency of the solar cell with separate internal and external absorption is also investigated. Different issues on carrier propagation, recombination, and collection are emphasized to highlight the effect of carrier quantization in material. The reliability analysis of the solar cell is also a new scope to investigate the trap-assisted recombination. The detail analysis and remarkable efficiency may bring a new path for next-generation solar cells.

Published in: IEEE Transactions on Electron Devices (Volume: 68 , Issue: 11, November 2021)

Page(s): 5518 - 5524

Date of Publication: 10 May 2021

INSPEC Accession Number: 21358959

DOI: 10.1109/TED.2021.3076034

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Contents

Energy from the Sun has been the most inspiring alternative solution to settle the ever-increasing demand of the world's energy requirements and establish a clean and green source of energy for future [1]. Currently, photovoltaic (PV) market analysis shows positive developments in the production of diverse technology and materials around the world. On the other hand, further enhancement of efficiency and high cost are the shortcomings of crystalline silicon (c-Si) solar cells, which brings a new scope to investigate on new materials to promote low-cost and high-efficiency PV technology [2]. Kesterite copper–zinc–tin–sulfide (CZTS) crystal is a new material having extensive potential to harvest energy from sunlight [3]. The kesterite-type CZTS is a derivative of two indium cations in the tetragonal unit cell of a chalcopyrite-type lattice, which are substituted for two tin cations, while the other two indium cations are substituted for two zinc cations [3]. It has a kesterite symmetrical structure with excellent optical parameters, electrical properties, and tunable bandgap from 1 to 1.5 eV. In addition, high absorption coefficient makes the material able to achieve high external quantum efficiency (EQE) [3]. Although thin-film chalcogenide materials such as CIGS and CdTe have achieved remarkable efficiency of 23% and 22.1%, respectively, being an earth-abundant material, kesterite solar cells also have tremendous potential to achieve high efficiency [4]. The use of materials such as indium, gallium, and tellurium in CIGS and CdTe is classified in critical raw materials [5]. Currently, CZTSSe with 12.6% and CZTS with 11% are recorded as highest efficiency separately [5]. In addition,

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Publication history

Currently known as:

Materials and Manufacturing Processes (1989 - current)

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Micro-electrochemical jet machining of large area microtexturing with tool movement strategy

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ul 2021, Published online: 09 Aug 2021

30/10426914.2021.1962535 Check for updates

ABSTRACT

Microtextured surfaces, particularly circular micropattern, significantly enhance the function and performance of microfabricated devices and engineering parts. A distinctive and inventive concept of maskless microelectrochemical jet machining (EJM) is utilized for producing the microcircular pattern over large area. In this research work, an advanced concept, i.e. maskless micro-EJM is presented to produce the

microtextures on large area using the reusable masked tool movement strategy on stainless steel. One masked patterned tool can fabricate many high-quality

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Research Article

Micro-electrochemical jet machining of large area microtexturing with tool movement strategy

S. Kunar

Pages 674-680 | Received 29 May 2021, Accepted 26 Jul 2021, Published online: 09 Aug 2021

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ABSTRACT

Microtextured surfaces, particularly circular micropattern, significantly enhance the function and performance of microfabricated devices and engineering parts. A distinctive and inventive concept of maskless microelectrochemical jet machining (EJM) is utilized for producing the microcircular pattern over large area. In this research work, an advanced concept, i.e. maskless micro-EJM is presented to produce the microtextures on large area using the reusable masked tool movement strategy on stainless steel. One masked patterned tool can fabricate many high-quality micropatterned samples over large area using the tool movement strategy.

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Original research article

Thermo-mechanical analysis of laser welding of Grade 91 steel plates

M. Zubairuddin [a], R. Ravi kumar [b], P.K. Chaursaia [b], Baharin Ali [c]

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Received 27 March 2021, Revised 5 June 2021, Accepted 19 June 2021, Available online 20 July 2021, Version of Record 22 July 2021.

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https://doi.org/10.1016/j.ijleo.2021.167510

Abstract

Generation of residual stresses and distortion in weld component is a major concern in Grade 91 steel thin plates. In the present study, FEM based Laser welding analysis of Grade 91 steel is carried out for 3 thick plates using SYSWELD software. Heat input optimization has been carried out by bead-on-plate welding at different heat input. Optimized heat input with full depth of penetration is used for a square butt joint of Grade 91 steel laser welding. Experimentally measured residual stresses using X-ray diffraction technique are compared with predicted results. Residual stresses comparison shows that due to phase transformation effect the peak tensile stress values are observed next to heat affected zone. The predicted distortion in longitudinal and transverse directions is validated with experimental results.

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Automated Computer Aided Diagnosis Using Altered Multi-Phase Level Sets in Application to Categorize the Breast Cancer Biopsy Images

Rajyalakshmi Uppada ✉ ... asad Kodati & Sanagapallela Koteswara Rao

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Abstract

As macroscopic Breast Cancer (BC) imaging diagnostics do not provide satisfied data, microscopic image analysis is used to get optimum cell-nuclei segmentation for image categorization. The paper presents a Novel Hybrid Segmentation Method which uses the energy detail coefficients attained from Non-Subsampled Contourlet Transform for cell-nuclei segmentation of BC histopathological images. NHSM solves the local

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Rajyalakshmi Uppada, Satya Prasad Kodati & Sanagapallela Koteswara Rao

Published online: 22 Aug 2021

Download citation https://doi.org/10.1080/03772063.2021.1962741

Abstract

As macroscopic Breast Cancer (BC) imaging diagnostics do not provide satisfied data, microscopic image analysis is used to get optimum cell-nuclei segmentation for image categorization. The paper presents a Novel Hybrid Segmentation Method which uses the energy detail coefficients attained from Non-Subsampled Contourlet Transform for cell-nuclei segmentation of BC histopathological images. NHSM solves the local inhomogeneities problem while preserving all necessary details. The

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Journal of Ambient Intelligence and Humanized Computing (2022) 13:2289–2308
https://doi.org/10.1007/s12652-021-02986-4

ORIGINAL RESEARCH

An integrated converter topology for torque ripple minimization in BLDC motor using an ITSA technique

Bapayya Naidu Kommula[1] · Venkata Reddy Kota[2]

Received: 27 August 2020 / Accepted: 27 February 2021 / Published online: 11 March 2021

Abstract
This paper proposed an enhanced DC–DC converter structure with hybrid control algorithm to diminish the torque ripple of a Brushless DC (BLDC) motor. Initially, the modeling of BLDC motor is designed with enhanced Cuk converter. Here, the operation and executions of Cuk converter is enhanced with the utilization of switched inductor. At that point, the control mechanism incorporates two controlling loops like speed and torque control loop are used to enhance the BLDC performance. So as to enhance the control loop operation, the Improved Tunicate Swarm optimization algorithm (ITSA) is presented. In this paper, the ITSA algorithm is explored to control the speed and torque error from BLDC motor. Here, the TSA search behavior is improved with crossover and mutation operator. In this paper, the output of proposed strategy is subjected with input of speed and torque controllers. Based on that, the best optimal gain parameters are resolved to upgrade the controller operation with the help of the required objective functions. The proposed controller is performed on the MATLAB/Simulink platform and the torque ripple minimization performance is compared with other existing systems like Particle Swarm Optimization algorithm and Bacterial Foraging algorithm.

Keywords Enhanced DC–DC converter · Speed control loop and torque control loop · Brush less DC · Torque ripple · Switched inductor

1 Introduction

The DC–DC converter has high capability based on speed driving structures, current and future timings are generally unpredictable. The BLDC motor is used as part of the zones of aeronautics, vehicle equipment and family machinery because of its minimal size, high power density, simple control and operation (Xia et al. 2014; Milivojevic et al. 2012; Huang et al. 2012a, b; Singh and Singh 2012) is considered to be the ideal choice for these parameters. BLDC motors consist of two classes. They are surface mounted permanent magnet BLDC motors and interior permanent-magnet BLDC motors (Faiz et al. 2017; Kommula and Kota 2018).

Normally, the Permanent magnet synchronous motors, is utilized as the drives of servo systems (Aghili 2011; Kommula and Kota 2019) which is otherwise called BLDC motor. A rotor has series of permanent magnets that are made of BLDC motors and the armature is static while the electronic control commutation system is used to circulate the electric power, rather than a mechanical commutator utilizing brushes. Unlike the mechanical commutator found in BLDC motors, a feedback as rotor-position into a control system is consolidated by BLDCs to accomplish commutation electronically. For smooth motor operation, regular BLDC motors drivers deliver with sinusoidal current waveforms. A sinusoidal commutation may bring about torque ripple due to the absence of a defective sinusoidal distributed magneto-motive force (Kommula and Kota 2016; 6; Kommula and Kota 2019). Generally framework execution can be improved by decreasing the speed fluctuations (Sung Jun Park et al. 2000; Aghiliet al. 2003) which has been exhibited by covering the motor drive's torque ripple of a servo system. By improving the machine plan, for instance, business superior electric motors diminish the pulsating torque expanding the quantity of the motor poles. Due to the

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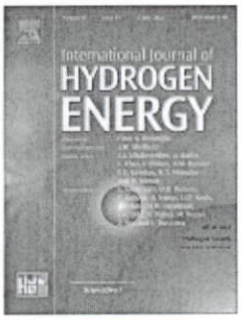

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Role of hydrogen in improving performance and emission characteristics of homogeneous charge compression ignition engine fueled with graphite oxide nanoparticle-added microalgae biodiesel/diesel blends

Parthasarathy Murugesan [a], Anh Tuan Hoang [b], Elumalai Perumal Venkatesan [c], Dash Santosh Kumar [c], Dhinesh Balasubramanian [d, e, f], Anh Tuan Le [g], Van Viet Pham [h]

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Received 26 June 2021, Revised 8 August 2021, Accepted 15 August 2021, Available online 4 September 2021.

https://doi.org/10.1016/j.ijhydene.2021.08.107

Highlights

- Dropped harmful emission by combination of GO and H_2-enriched ES20D80 in HCCI mode.
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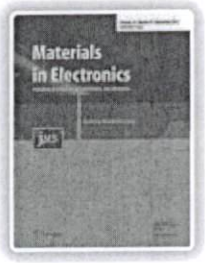

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Published: 20 October 2021

Preparation of sulfur doped TiO_2 nanoparticles from rutile sand and their performance testing in hybrid solar cells

S. Arunmetha, N. R. Dhineshbabu, Atul Kumar & R. Jayavel

Journal of Materials Science: Materials in Electronics
32, 28382–28393 (2021)

Abstract

A new method was adopted to prepare sulfur contained TiO_2 nanoparticles extracted from rutile sand by chemical extraction process. The main aim of this work was to reduce the complexity of synthesis processes using a facile, scalable, and economic approach. The advantage of using sulfur dopant in the prepared sample was characterized and compared with the pure TiO_2 nanoparticles. The widespread characterization studies revealed that S–TiO_2 possesses 15–20 nm crystallite size and a spherical morphology with 95 $m^2 g^{-1}$ surface area. S–TiO_2 showed improved optical absorption shifted from the UV to visible region compared to pure TiO_2, thereby increasing photogenerated electrons and holes. The S–TiO_2 nanoparticles were applied to the hybrid solar cells active layer and the conversion efficiency was increased from 0.62 to

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N. R. Dhineshbabu

Centre for Nanoscience and Technology, Anna University, Chennai, 600025, India

R. Jayavel

Contributions

RJ planned and supervised the research work with necessary study materials; SA, the main author, carried out the experiments and investigations. NRD and AK conceived the methodology and reviewed the manuscript. All authors read and agreed to the final version of the manuscript.

Corresponding author

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Volume 197, 2022 - Issue 3: ICAMS-21 e-Conference; Guest Editor: Dr. Mohanraj

Articles

Material characterizations of *Moringa oleifera* gum (MOG)

R. Vettumperumal

N. R. Dhineshbabu

b Department of Electronics and Communication Engineering, Aditya Engineering College, Surampalem, Andhra Pradesh, India

Pages 231-236 | Received 20 Jul 20

Abstract

The present study is focused on an inspection of the behavior of moringa oleifera gum. Attention paid to this material has increased the cultivation of the tree which plays a vital role to reduce global warming. Therefore, the authors make an effort to explore the properties of the material (structural, thermophysical, dielectric, and optical) of moringa oleifera gum (MOG) by X-ray diffraction method (XRD, field emission scanning electron microscope (FESEM), differential scanning calorimetry (DSC), impedance spectroscopy, Fourier transform infrared (FTIR) spectroscopy and ultra-violet (UV) visible spectroscopy methods. MOG shows a crystalline nature and its diffraction pattern is matched with the Ca_2SiO_4 crystalline structure. The existence of

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Articles

Material characterizations of *Moringa oleifera* gum (MOG)

R. Vettumperumal, N. R. Dhineshbabu & B. Karthikeyan

Pages 231-236 | Received 20 Jul 2021, Accepted 03 Oct 2021, Published online: 12 Oct 2021

Download citation https://doi.org/10.1080/10426507.2021.1989682

Abstract

The present study is focused on an inspection of the behavior of moringa oleifera gum. Attention paid to this material has increased the cultivation of the tree which plays a vital role to reduce global warming. Therefore, the authors make an effort to explore the properties of the material (structural, thermophysical, dielectric, and optical) of moringa oleifera gum (MOG) by X-ray diffraction method (XRD, field emission scanning electron microscope (FESEM), differential scanning calorimetry (DSC), impedance spectroscopy, Fourier transform infrared (FTIR) spectroscopy and ultra-violet (UV) visible spectroscopy methods. MOG shows a crystalline nature and its diffraction pattern is matched with the Ca_2SiO_4 crystalline structure. The existence of the Ca_2SiO_4 structure is confirmed by elemental composition analysis and FTIR spectroscopy data. The melting point (55 °C) and specific heat capacity (65.43 J/g°C) of MOG are calculated from the DSC thermogram. At the low-frequency region, MOG exhibits conventional polar dielectric behavior with a high

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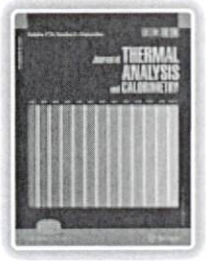

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Published: 26 February 2021

Effects of antioxidants to reduce the harmful pollutants from diesel engine using preheated palm oil–diesel blend

P. V. Elumalai, B. Dhinesh, J. Jayakar, M. Nambiraj & V. Hariharan

Journal of Thermal Analysis and Calorimetry **147**, 2439–2453 (2022)

Abstract

At present, IC engines are the primary power source in transit and must never be modified. The palm oil was collected from the palm tree and used in an internal combustion engine as an alternative fuel. In the present investigation, the palm oil is preheated to 110 °C using a heat exchanger to get a homogeneous mixture. The two additives, i.e., butylated hydroxytoluene (BHT) and *n*-butanol, were combined with preheated palm oil. The four fuels were prepared PN100, PND20, PND20 mixing with the 2000 ppm BHT of 1000 mL oil and other blends preheated PND20 palm oil mixing with the 2000 ppm *n*-butanol of 1000 mL oil. The blend 20 brake thermal efficiency was increased by 11.70% when compared with the mineral fuel, because the proper air–fuel mixture takes place. The oxides of nitrogen and smoke opacity were

Therm Anal Calorim. 2019;137:593–605. https://doi.org/10.1007/s10973-018-7948-6.

43. Zahir Hussain A, Santhoshkumar A, Ramanathan A. Assessment of pyrolysis waste engine oil as an alternative fuel source for diesel engine. J Therm Anal Calorim. 2020;1:1. https://doi.org/10.1007/s10973-020-09516-y.

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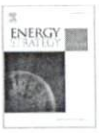
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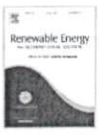
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Effect of injection timing in reducing the harmful pollutants emitted from CI engine using N-butanol antioxidant blended eco-friendly Mahua biodiesel

Elumalai P.V. [a], Parthasarathy M. [b], Joshua Stephen Chellakumar Isaac JoshuaRamesh Lalvani [c], Hassan Mehboob [d], Olusegun David Samuel [e, f], Christopher C. Enweremadu [f], C. Ahamed Saleel [g], Asif Afzal [h, i]

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Received 23 June 2021, Revised 31 August 2021, Accepted 11 September 2021, Available online 27 September 2021, Version of Record 27 September 2021.

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https://doi.org/10.1016/j.egyr.2021.09.028

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Original Research Article | Published: 04 October 2021

Analysis of Electrical and Impedance Properties of the Group-I (Li, Na, K & Cs) Doped ZnO Nanorods

R. Vettumperumal, C. Maheswaran, J. Henry, K. Mohanraj & N. R. Dhineshbabu

Journal of Electronic Materials **50**, 7110–7118 (2021)

Abstract

ZnO and ZnO seed layers doped with group-I elements (Li, Na, K & Cs) were prepared by spin coating. Seed layer is used to prepare nanorods by hydrothermal method. Doped and undoped nanorods structural, surface morphology, and electrical conductivity properties are characterized by x-ray diffraction, field emission scanning electron microscopy (FESEM), and impedance spectroscopy. Undoped and doped ZnO nanorods show wurtzite structure without a secondary phase. Vertically aligned hexagonal-shaped nanorods are observed from FESEM and surface porosity is calculated. A single conduction process with a Debye relaxation peak is obtained in all the nanorods from impedance analysis. Electrical conductivity (σ_{ac}) measurement of undoped and doped ZnO nanorods follows Janscher's power law with high-frequency exponent values which leads to

Solid State Chem. 177, 207 (2004).

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N. R. Dhineshbabu

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The authors declare that they have no known competing financial interests or personal

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Research Article

Performance analysis of coal cleaning operations: Role of Probable Error in Separation and Organic Efficiency

Subha Ranjan Paul

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ABSTRACT

The Separation efficiency of coal cleaning equipment is typically assessed by Probable Error in Separation (E_p) and Organic Efficiency (E_{org}). The first one is determined based on the precise cut point density of separation and implies that for ideal separation the error is zero. The second one is calculated based on the yield of clean coal/middling at the target ash and implies that for ideal separation the efficiency is 100%. Plant

operators worldwide being accountable for the tonnage of the clean coal and middling produced regularly monitor E_{org} with some application in plant design in India. E_p is

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Performance analysis of coal cleaning operations: Role of Probable Error in Separation and Organic Efficiency

Subha Ranjan Paul & Sumantra Bhattacharya

Received 13 Aug 2021, Accepted 28 Oct 2021, Published online: 11 Nov 2021

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ABSTRACT

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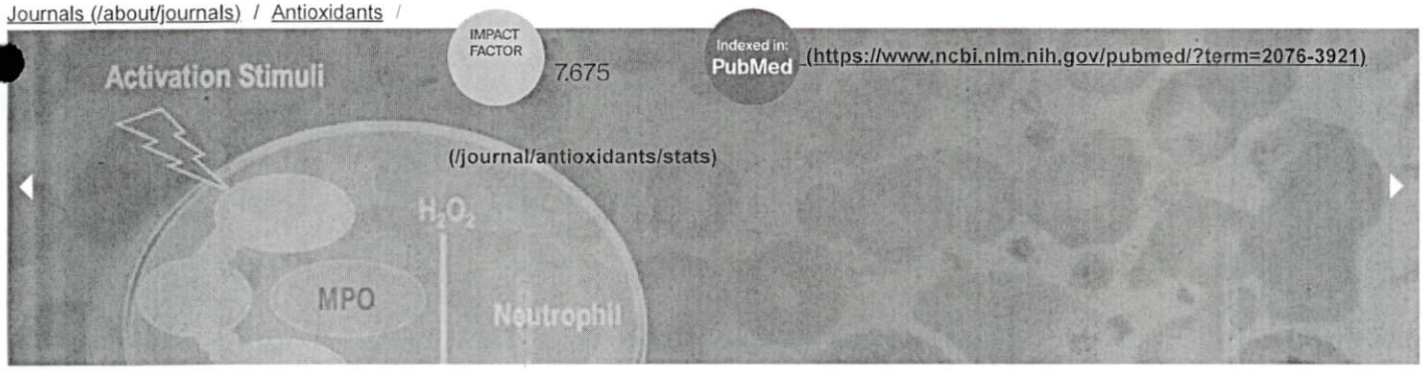
The Separation efficiency of coal cleaning equipment is typically assessed by Probable Error in Separation (E_p) and Organic Efficiency (E_{org}). The first one is determined based on the precise cut point density of separation and implies that for ideal separation the error is zero. The second one is calculated based on the yield of clean coal/middling at the target ash and implies that for ideal separation the efficiency is 100%. Plant operators worldwide being accountable for the tonnage of the clean coal and middling produced regularly monitor E_{org} with some



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Article

Correlation Study of Antioxidant Activity with Phenolic and Flavonoid Compounds in 12 Indonesian Indigenous Herbs

Yeni Maulidah Muflihah [1,2], Ganesh Gollavelli [3] and Yong-Chien Ling [1,*]

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Abstract: The antioxidant activity (AA), total phenolic content (TPC), and total flavonoid content (TFC) of selected Indonesian *Zingiberaceae* herbs were determined. An optimization extraction procedure was conducted by using Taguchi L_{16} orthogonal array. Four chemical assays were applied, including 2,2-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity assay, H_2O_2 scavenging activity assay, Folin–Ciocalteau (F–C) assay, and $NaNO_2$-$AlCl_3$-NaOH assay, which revealed remarkable differences in AA, TPC, and TFC. The result indicated the diversity of AA composition among the herbs, and *C. longa* exhibited the highest AA. HPLC-PAD analysis revealed that curcumin was present in five high antioxidant herbs, and the highest amount was in *C. longa*. Pearson correlation analysis indicated that the identified TPC and TFC were significant contributors to AA, and curcumin was likely the main contributing antioxidant compound. Our approach concluded that *C. longa* is the greatest source of natural antioxidants among 12 Indonesian indigenous *Zingiberaceae* herbs. The use of a mixed-method approach to augment the findings of solitary methods might facilitate future researchers to uncover deeper and hidden meanings.

Keywords: antioxidant activity; correlation analysis; flavonoid; Indonesian herbs; phenolic; mixed-method

Citation: Muflihah, Y.M.; Gollavelli, G.; Ling, Y.-C. Correlation Study of Antioxidant Activity with Phenolic and Flavonoid Compounds in 12 Indonesian Indigenous Herbs. *Antioxidants* **2021**, *10*, 1530. https://doi.org/10.3390/antiox10101530

Academic Editor: David Arráez-Román

Received: 15 August 2021
Accepted: 24 September 2021
Published: 27 September 2021

1. Introduction

The antioxidants are generally known as natural or synthetic compounds which avoid or prolong the damage of cells in the presence of reactive oxygen by opposing the oxidation process or inhibiting the reaction promoted by oxide or peroxide species, mostly known as free radical oxygen species [1]. The free radicals generated during cell metabolism will be deactivated and stabilized by the antioxidants before and after attacking the targets in the biological system [2]. Effective antioxidants break down the radical chain reaction and act as radical scavengers [1,3]. Antioxidants therefore play a predominant role as stabilizers to maintain biological functions without fail.

Antioxidants are from either natural or synthetic source. Natural plant extracts are usually rich in antioxidants, which are good sources for food additives, medicine, and cosmetics purposes [4]. In food, antioxidants are needed to prevent food deterioration during storage or processing and maintain the food quality of freshness, nutrients, texture, aroma, and functionality [5]. Antioxidants are present in food itself or by external addition. In medicinal use, antioxidant activity is generally due to their ability to exhibit radical scavenging capacities. The phytochemicals such as phenolics, flavonoids, anthocyanins, carotenoids, ascorbic acids, terpenoids, tannins, and tocopherols in medicinal plants are known for preventing and curing disease [6]. In cosmetics, the effective use of topical antioxidants to improve the protection system of endogenous cutaneous is well known [7].

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Diminishing Energy Consumption Cost and Optimal Energy Management of Photovoltaic Aided Electric Vehicle (PV-EV) By GFO-VITG Approach

ajin, Dr. Balapanur Mouli Chandra &

Mr. Bapayya Naidu Kommula

d Department of Electrical and Electronics Engineering, Aditya Engineering College(A), Andhra Pradesh, India

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d online: 21 Oct 2021

30/15567036.2021.1986606

ABSTRACT

This paper proposes a hybrid GFO-VITG approach for the energy management system (EMS) of the photovoltaic (PV) aided electric vehicle (EV). The proposed system is the combination of Ground water flow optimization (GFO) and Vascular Invasive Tumor Growth optimization algorithm (VITG), and hence, it is known as the GFO-VITG method. The main aim of this paper is optimal energy management for

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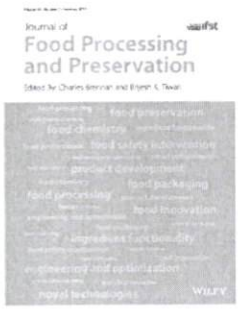

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Volume 45, Issue 12
December 2021
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ORIGINAL ARTICLE

Functional, thermal, pasting, and rheological properties of gluten-free maize composite flour: Effect of moth bean flour and hydrocolloid addition

Sai Krishna Vedantam, Jhansi Lakshmi Sagili, Praveen Kumar Dikkala, Kandi Sridhar

First published: 25 Oct

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Contribution: Writing - review & editing
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Abstract

Celiac disease is triggered by the consumption of gluten-rich foods that has emerged as a major global health problem. In fact, it is now important to look for an alternate and cheap source to develop a gluten-free diet using alternative ingredients. Therefore, the aim of the study was to evaluate the effect of moth bean flour and xanthan gum addition on the functional, thermal, pasting, and rheological properties of gluten-free maize dough. The results showed that the addition of moth bean and xanthan gum increased the functional (e.g., water absorption capacity of 1.89–2.52 g/g) and thermal (e.g., gelatinization onset temperature [T_o: 68.55–70.55°C] and enthalpy [ΔH: 1.66–2.89 J/g]) properties, while pasting properties varied. All formulations showed more solid-elastic than viscous behavior ($G' > G''$) with $\tan\delta < 1$. Thus, the study concluded that the addition of protein source and hydrocolloid to maize flour can be a potential alternative to

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Sundaramoorthy, V. S. Padmapriya &

Dhineshbabu Nattanmai Raman

c Department of Electronics and Communication Engineering, Aditya Engineering College, Surampalem, Andhra Pradesh, India

lov 2021, Published online: 08 Dec 2021

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Abstract

Synthetic polyvinyl alcohol (PVA) was used as a matrix, and polyaniline/SWCNT (PS) was used as a filler in the composite to create thin films for electromagnetic interference (EMI) shielding. The blending methods, namely mechanical stirring and ultrasonication, were used to produce composites (commercially available

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Preparation of freestanding films from SWCNT/PANI nanocomposites using different blending techniques and characterization of their EMI shielding effectiveness in X-band

O. V. P. R. Siva Kumar, **Arunmetha Sundaramoorthy**, V. S. Padmapriya & Dhineshbabu Nattanmai Raman

Pages 209-217 | Received 02 Sep 2021, Accepted 26 Nov 2021, Published online: 08 Dec 2021

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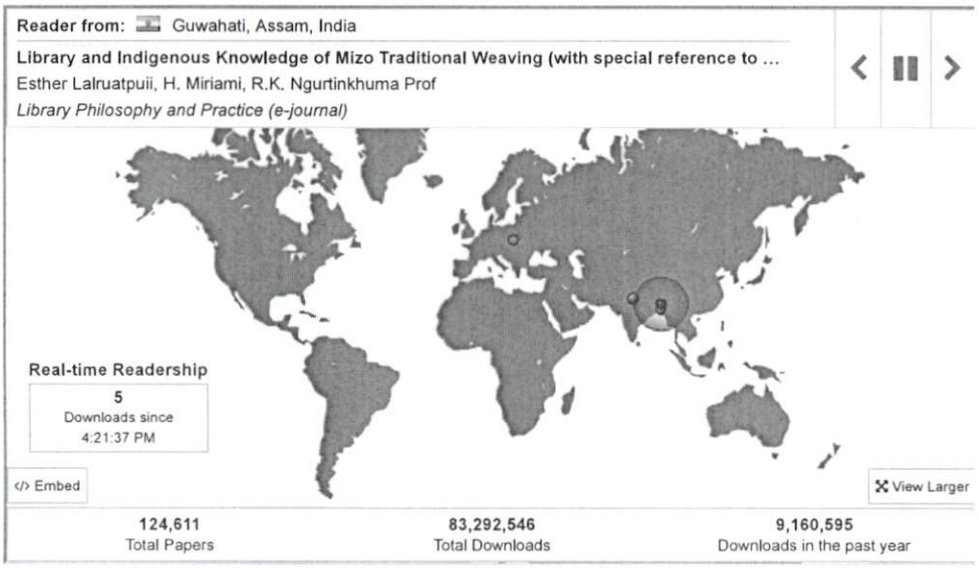

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Optimal Distributed Generator Placement - A Bibliometric Survey

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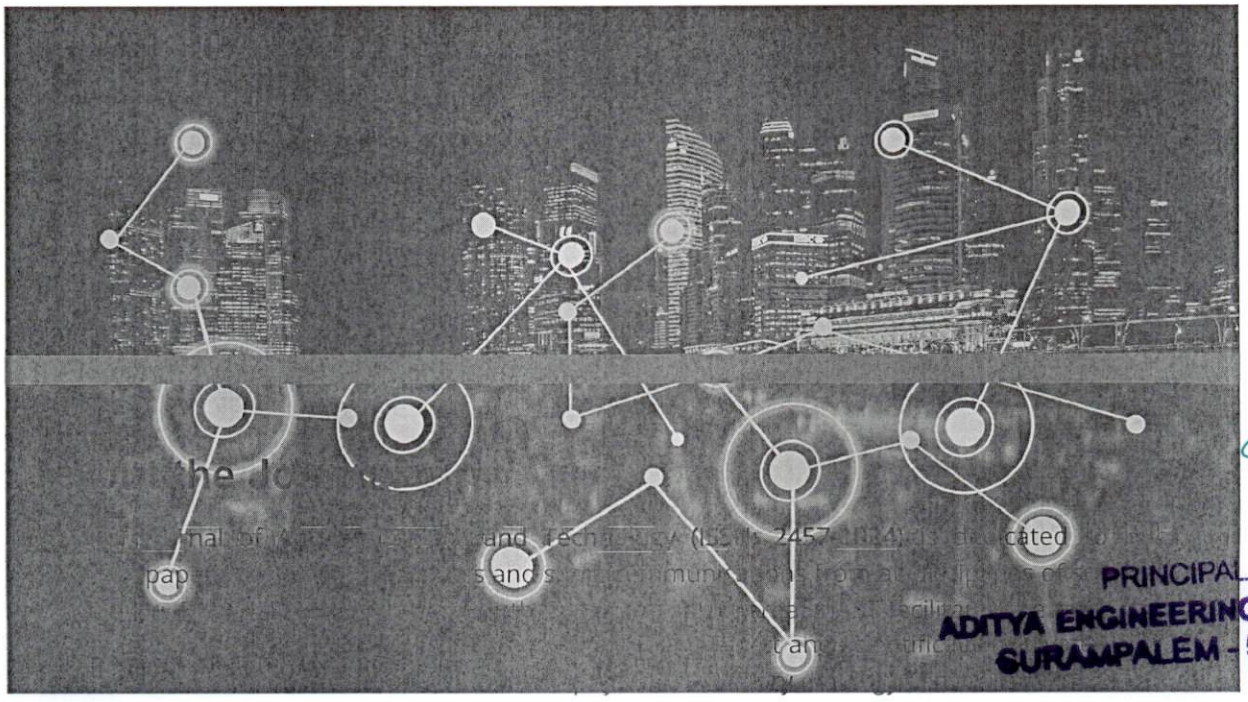

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ISSN: 2231-0843 (old)

NLM ID: 101664541

Journal DOI: http://dx.doi.org/10.9734/cjast (https://dx.doi.org/10.9734/cjast) (Link) (https://search.crossref.org/?q=http%3A%2F%2Fdx.doi.org%2F10.9734%2Fcjast)

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40(12): 59-68, 2021; Article no.CJAST.69135
ISSN: 2457-1024
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Effect of Different Mulching Materials on Yield and Growth Parameters of Tomato Crop

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CJAST/2021/v40i1231381
Editor(s):
(1) Dr. Chen Chin Chang, Hunan Women's University, China.
Reviewers:
(1) Renisson Neponuceno de Araújo Filho, Universidade Federal do Tocatins, Brazil.
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Original Research Article

Received 27 March 2021
Accepted 03 June 2021
Published 07 June 2021

ABSTRACT

The present investigation was carried out to study the performance of yield and growth parameters of tomato crop under different mulching materials. This experiment was conducted at Vikas College of Engineering and Technology, Nunna, Vijayawada during the period from Jan 2020 to April 2020. The experimental field has an area of 180 m^2 (15m × 12m) and divided into 4 plots i.e., Drip with plastic mulch (A), Drip with live mulch (coconut coir) (S), Drip without mulch (M) and Control (without mulch and without drip) (K). Growth parameters like plant height, number of leaves per plant, soil parameters like bulk density, soil temperature, soil moisture and yield were observed for each treatment. Crop water requirement was calculated using CROPWAT 8.0. The results showed that the bulk density has no effect between the treatment plots. The soil moisture in initial stage is more in K and least in S; in flowering stage, M was high and least in K and in harvesting stage, it is high in A. The soil temperature was high in K and least in A. The readings of number of leaves was observed high in A and least in K. It was observed that highest yield was obtained in A and least in K. The weed control efficiency was found to be highest in A (57%) followed by S (41.3%) and weed control efficiency was lowest in M (22.8%).

Keywords: Mulch; crop water requirement; CROPWAT 8.0; weed control efficiency

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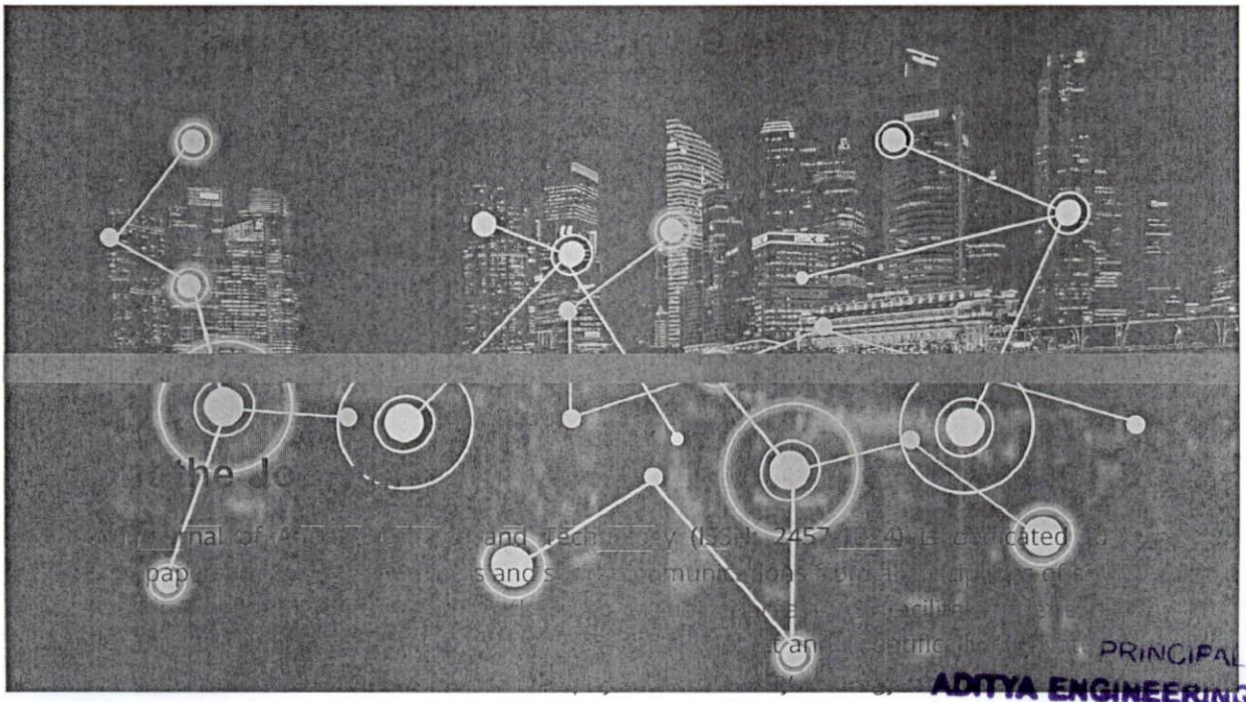

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Journal DOI: http://dx.doi.org/10.9734/cjast (https://dx.doi.org/10.9734/cjast) (Link) (https://search.crossref.org/?q=http%3A%2F%2Fdx.doi.org%2F10.9734%2Fcjast)

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40(14): 87-91, 2021; Article no.CJAST.69058
ISSN: 2457-1024
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Rehydration Characteristics of Mushrooms using Different Drying Techniques

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Authors' contributions

This work was carried out in collaboration between both authors. Autho YV designed the study, performed the lab analysis, wrote the methodology, and wrote the first draft of the manuscript. Author NY managed the literature searches. Both authors read and approved the final manuscript.

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DOI: 10.9734/CJAST/2021/v40i1431406
Editor(s):
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Original Research Article

Received 10 April 2021
Accepted 15 June 2021
Published 28 June 2021

ABSTRACT

Mushroom may be baked, fried, boiled, creamed, roasted, pickled and stuffed. In India, it is mainly consumed fresh and a negligible amount is used for processing. They can be processed as canned, dried and frozen mushrooms. The dried mushrooms are packed in hermetically sealed air tight tins for quality retention and stored in a cool dry place. The study's main objective is to know the effect of different drying methods on the quality of mushrooms and its dehydration, rehydration characteristics. Sun-drying and Cabinet tray drying methods were selected in the study. The rehydration ratio and coefficient of rehydration were calculated and compared for both the drying methods. An expert Committee did an Organoleptic evaluation. The results showed that cabinet tray dried mushrooms were reconstituted better compared to the sundried ones. The values of coefficient of rehydration and the rehydration ratio for cabinet dried mushrooms were found as 0.498 and 1:3.3 which were higher than sundried mushrooms. Cabinet tray dried mushrooms showed it's superiority in sensory assessment. The study concluded that mushrooms dehydrated by the cabinet tray drying have better rehydration characteristics than sun drying.

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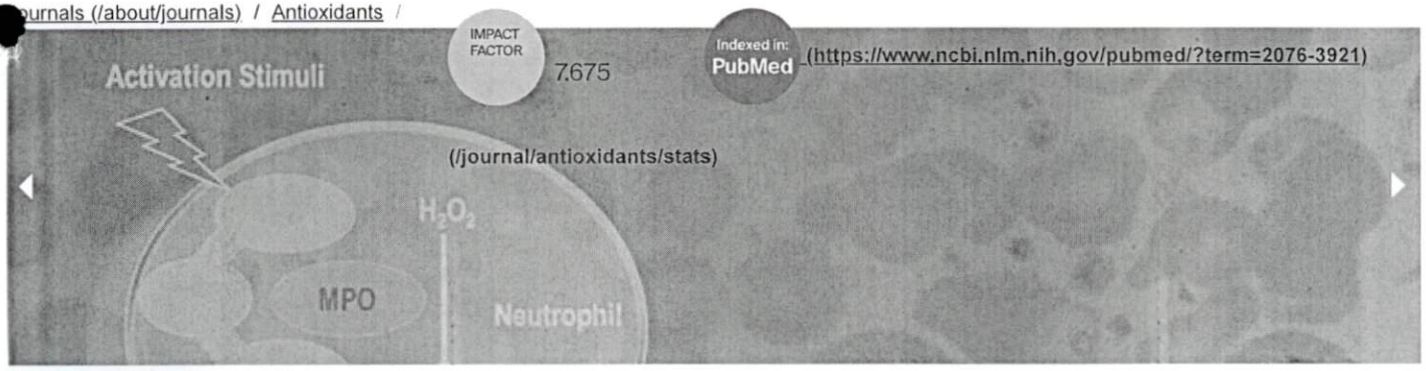

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by Aleksandra Szydlowska-Czerniak (https://sciprofiles.com/profile/1239531), Monika Momot (https://sciprofiles.com/profile/author/Sm1xMWVoamxNTG5CVXlPUGJjQWRlcTZRekoyT1puMHFrVk94ejFkSHRFND0=), Barbara Stawicka (https://sciprofiles.com/profile/2377621) and Dobrochna Rabiej-Kozioł (https://sciprofiles.com/profile/1282867)

Antioxidants **2022**, *11*(8), 1556; https://doi.org/10.3390/antiox11081556 (registering DOI) - 11 Aug 2022

Abstract The antioxidant capacity (AC); amounts of tocopherols, sterols, and polycyclic aromatic hydrocarbons; oxidative parameters; fatty acid composition (FAC); and sensory quality of cold-pressed black cumin oils (CPBCOs) available on the Polish market were analyzed and compared. The AC levels of the CPBCO samples **[...] Read more.**

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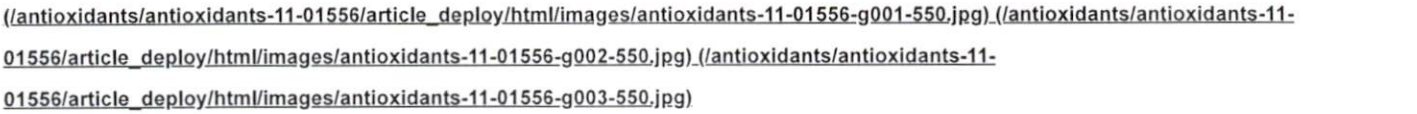

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Antioxidant Potential of Non-Extractable Fractions of Dried Persimmon (*Diospyros kaki* Thunb.) in Streptozotocin-Induced Diabetic Rats (/2076-3921/11/8/1555)

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Antioxidants **2022**, *11*(8), 1555; https://doi.org/10.3390/antiox11081555 (registering DOI) - 11 Aug 2022

Abstract Oxidative stress causes the progression of diabetes and its complications; thus, maintaining the balance between reactive oxygen species produced by hyperglycemia and the antioxidant defense system is important. We herein examined the antioxidant potential of non-extractable fractions of dried persimmon (NEP) against oxidative **[...] Read more.**

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Oxidative Stress, Neuroinflammation and Neurodegeneration: The Chicken, the Egg and the Dinosaur (/2076-3921/11/8/1554)

by Peter M. J. Quinn (https://sciprofiles.com/profile/692191), António Francisco Ambrósio (https://sciprofiles.com/profile/1064767) and Celso Henrique Alves (https://sciprofiles.com/profile/777830)

Antioxidants **2022**, *11*(8), 1554; https://doi.org/10.3390/antiox11081554 (registering DOI) - 11 Aug 2022

Abstract Neurodegenerative diseases are characterized by the progressive degeneration of the neuronal cells and their networks, hampering the function of the central or peripheral nervous system [...] **Full article (/2076-3921/11/8/1554)**

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Ozone Pollution, Oxidative Stress, Regulatory T Cells and Antioxidants (/2076-3921/11/8/1553)

by Selva Rivas-Arancibia (https://sciprofiles.com/profile/97694), Eduardo Hernández-Orozco (https://sciprofiles.com/profile/2317177), Erika Rodríguez-Martínez (https://sciprofiles.com/profile/author/VmhPNTR3OVVxN2pQeG5EWGJGUENMKzNPZXVSc09ML3JkYWZhY2VIMFhK

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Correlation Study of Antioxidant Activity with Phenolic and Flavonoid Compounds in 12 Indonesian Indigenous Herbs

Yeni Maulidah Muflihah [1,2], Ganesh Gollavelli [3] and Yong-Chien Ling [1,*]

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2 Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Jember, Jember 68132, Indonesia
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Abstract: The antioxidant activity (AA), total phenolic content (TPC), and total flavonoid content (TFC) of selected Indonesian *Zingiberaceae* herbs were determined. An optimization extraction procedure was conducted by using Taguchi L_{16} orthogonal array. Four chemical assays were applied, including 2,2-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity assay, H_2O_2 scavenging activity assay, Folin–Ciocalteau (F–C) assay, and $NaNO_2$-$AlCl_3$-NaOH assay, which revealed remarkable differences in AA, TPC, and TFC. The result indicated the diversity of AA composition among the herbs, and *C. longa* exhibited the highest AA. HPLC-PAD analysis revealed that curcumin was present in five high antioxidant herbs, and the highest amount was in *C. longa*. Pearson correlation analysis indicated that the identified TPC and TFC were significant contributors to AA, and curcumin was likely the main contributing antioxidant compound. Our approach concluded that *C. longa* is the greatest source of natural antioxidants among 12 Indonesian indigenous *Zingiberaceae* herbs. The use of a mixed-method approach to augment the findings of solitary methods might facilitate future researchers to uncover deeper and hidden meanings.

Keywords: antioxidant activity; correlation analysis; flavonoid; Indonesian herbs; phenolic; mixed-method

Citation: Muflihah, Y.M.; Gollavelli, G.; Ling, Y.-C. Correlation Study of Antioxidant Activity with Phenolic and Flavonoid Compounds in 12 Indonesian Indigenous Herbs. *Antioxidants* **2021**, *10*, 1530. https://doi.org/10.3390/antiox10101530

Academic Editor: David Arráez-Román

Received: 15 August 2021
Accepted: 24 September 2021
Published: 27 September 2021

1. Introduction

The antioxidants are generally known as natural or synthetic compounds which avoid or prolong the damage of cells in the presence of reactive oxygen by opposing the oxidation process or inhibiting the reaction promoted by oxide or peroxide species, mostly known as free radical oxygen species [1]. The free radicals generated during cell metabolism will be deactivated and stabilized by the antioxidants before and after attacking the targets in the biological system [2]. Effective antioxidants break down the radical chain reaction and act as radical scavengers [1,3]. Antioxidants therefore play a predominant role as stabilizers to maintain biological functions without fail.

Antioxidants are from either natural or synthetic source. Natural plant extracts are usually rich in antioxidants, which are good sources for food additives, medicine, and cosmetics purposes [4]. In food, antioxidants are needed to prevent food deterioration during storage or processing and maintain the food quality of freshness, nutrients, texture, aroma, and functionality [5]. Antioxidants are present in food itself or by external addition. In medicinal use, antioxidant activity is generally due to their ability to exhibit radical scavenging capacities. The phytochemicals such as phenolics, flavonoids, anthocyanins, carotenoids, ascorbic acids, terpenoids, tannins, and tocopherols in medicinal plants are known for preventing and curing disease [6]. In cosmetics, the effective use of topical antioxidants to improve the protection system of endogenous cutaneous is well known [7].

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Iranian Journal of Materials Science and Engineering, Vol. 18, Number 3, September 2021
RESEARCH PAPER

Effect of Ultraviolet and Solar Radiation on Photocatalytic Dye (Black-E and Congo Red) Degradation Using Copper Oxide Nanostructure Particles

Usha Vengatakrishnan[1], Kalyanaraman Subramanian[1], Vettumperumal Rajapandi[2], Dhineshbabu Nattanmai Raman[3]
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Received: February 2021 **Revised: May 2021** **Accepted: June 2021**
DOI: 10.22068/ijmse.2145

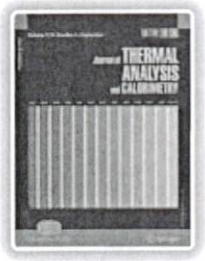
Abstract: *Copper oxide (CuO) nanostructure particles were prepared using KOH/NaOH catalyst by low cost precipitation method and characterized by powder X-ray diffraction (PXRD), scanning electron microscope (SEM) and energy dispersive X-ray spectra (EDX) analysis. The photocatalytic dye degradation study of pure CuO nanostructure particles are analysed against two azo dyes (Direct black 38 (Black-E) and Congo red) under ultraviolet (UV) and solar irradiation. The release of major active species (*OH) in the photocatalytic degradation by as prepared CuO nanostructure particles were investigated by photoluminescence (PL) spectra with two different excitation wavelength (325 and 355nm). The band gap of CuO nanostructure particles was calculated from diffuse reflectance spectra. The photocatalytic effect of CuO nanostructure particles is confirmed by the UV – Vis and photoluminescence spectra and from the kinetic studies under UV and solar radiations. The photocatalytic degradation results revealed that 16.35 and 7.5% of black E and Congo red dye was degraded under UV, while the degradation was 47.2 and 17.6% under solar light. The influence of pH on the photodegradation and change in the reaction temperature under solar irradiation were also investigated.*

Keywords: *copper oxide, precipitation method, photocatalytic activity, azo dyes, dyedegradation.*

1. INTRODUCTION

Nanotechnology is based on the smallest units of matter to process new material and devices towards superior scale performance on the basis of atomic scale range. Metal oxide nanoparticles are versatile materials with many scientific and industrial applications. [1] Copper oxide (CuO) is found to be a p-type semiconducting material with indirect bandgap of 1.2-1.51 eV and direct band gap of the order of 3.5 eV. [2, 3] It is also used in wide range of various applications like gas sensors [4], lithium ion batteries [5], solar cells [6], magnetic storage media [7], catalysis [8], field emission devices and semiconductors. CuO nanoparticles have been synthesised by many efficient approaches such as hydrothermal process [9], precipitation [10], microwave irradiation [11], co-precipitation [12], pyrolysis and thermal decomposition method [13], respectively. Among these, sol-gel method is energy efficient and less time-consuming process; however other processes are involved intricate synthesis process and energy intensive.

Nowadays, the water pollution is one of the major problems in the world. The continuous rise in the population with industrialization causes series number of hazardous organic contaminants disposed into natural water sources which are resistant to conventional chemical and biological treatments [14]. Several types of hazardous pollutants such as dyes, organic compounds, pharmaceuticals, heavy metals, agricultural chemicals and radioactive materials have been detected in the water sources. Among these, dyes are majorly used in different industries where it is estimated that nearly 15% of chemical dyes are directly disposed into the natural environment. Azo dyes are used in a diverse range of industries including paper, textile, food, additives, cosmetics, xerography, laser materials and laser printing industries [15]. Azo dyes are the largest group of synthetic dyes that are characterized by nitrogen to nitrogen double bonds (–N=N–). Therefore, sustainable approach in the waste water management includes novel and improved wastewater treatment technologies that are needed in order to reduce negative impacts on the water bodies. It is used to facilitate recycling and reuse of waste water. Some of the promising



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Published: 26 June 2021

Experimental investigation for stability and surface properties of TiO_2 and Al_2O_3 water-based nanofluids

Pritam Kumar Das, Arnab Kumar Mallik, Altaf Hossain Molla, Apurba Kumar Santra, Ranjan Ganguly, Abhijit Saha, Sugam Kumar & V. K. Aswal

Journal of Thermal Analysis and Calorimetry **147**, 5617–5635 (2022)

Abstract

Nanofluids have gained recent attention because of their potential applications in diverse engineering fields like enhancing thermal transport, particle deposition, coating, surface patterning, etc. Stability of nanofluid is vital for their use in these industrial applications, although the pertinent database in the literature is often inadequate. Herein, we investigate the effect of surfactant concentration and particle solid volume fraction (φ) on stability of Ti- and Al-oxide nanoparticle suspensions that are stabilized with different surfactants. While TiO_2-AA, TiO_2-CTAB nanofluids are found to have appreciable stability, SDBS-stabilized Al_2O_3 nanofluid shows otherwise. TEM images provide the morphological characteristics of freshly prepared nanofluids, whereas the data of DLS and ZP are used to describe the nanofluid

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Sugam Kumar & V. K. Aswal

Contributions

PKD and AKM have carried out the experiments and data analysis and have contributed toward the manuscript preparation; AH, AS, SK and VKA have carried out the SANS measurements and analysis and data interpretation, AKS and RG have contributed towards planning and execution, manuscript preparation.

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Research Article | Published: 27 September 2021

Influence of anti-washout admixtures on the strength and microstructural characteristics of geopolymer concrete

Ramamohana Reddy Bellum

Journal of Building Pathology and Rehabilitation **6**, Article number: 35 (2021)

Abstract

Recent investigations proved that geopolymers produced with different industrial by-products have shown superior mechanical and microstructural performances compared to ordinary Portland cement (OPC) concrete. This study investigates the effectiveness of using different anti-washout admixtures (AWAs) to produce geopolymer concrete (GC) based underwater concrete (UWC). Two different AWAs were used in the present study i.e. Arabic gum (AG) and xanthan gum (XG). However, in the fabrication of GC two types of industrial by-products were used such as fly ash (FA) and ground granulated blast furnace slag (GGBFS). The influence of GC mixes in UWC was assessed in terms of workability, washout resistance, compressive strength, bleeding capacity and microstructural characteristics. The results indicate that among all GC samples, AG based

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Ethics declarations

Conflict of interest

The authors declare that they have no conflict of interest.

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Bellum, R.R. Influence of anti-washout admixtures on the strength and microstructural characteristics of geopolymer concrete. *J Build Rehabil* **6,** 35 (2021). https://doi.org/10.1007/s41024-021-00129-y

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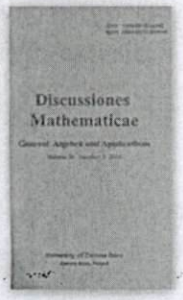

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https://doi.org/10.7151/dmgaa.1365

QUASI-COMPLEMENTED *BE*-ALGEBRAS

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Abstract

The concept of O-filters is introduced in commutative BE-algebras. An equivalent condition is derived for every strong regular filter of a BE-algebra to become an O-filter. The concept of quasi-complemented BE-algebras is introduced and also characterized these classes of BE-algebras in terms of dual annihilators. The concept of strong regular filter is introduced and then quasi-complemented BE-algebras and strong BE-algebras are characterized in terms of strong regular filters and O-filters.

Keywords: commutative BE-algebra, O-filter, quasi-complemented BE-algebra, strong BE-algebra, strong regular filter.

2010 Mathematics Subject Classification: 03G25.

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International Journal of Thermal Sciences
Volume 168, October 2021, 107068

Thermo-hydraulic performance of a solar air heater with staggered C-shape finned absorber plate

A. Saravanan [a] ✉, M. Murugan [b], M. Sreenivasa Reddy [a], P.S. Ranjit [a], P.V. Elumalai [a], Pramod Kumar [b], S. Rama Sree [c]

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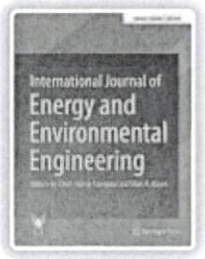
Received 4 February 2021, Revised 21 April 2021, Accepted 13 May 2021, Available online 20 May 2021, Version of Record 20 May 2021.

https://doi.org/10.1016/j.ijthermalsci.2021.107068

Highlights

- An experimental work is done with staggered C-shape fins placed on absorber plate of solar air heater.
- The effect of relevant geometric parameters is examined.
- Performance of C-shape finned absorber plate solar air heater with and without perforated has been investigated.
- The heat transfer for perforated finned absorber plate can be enhanced by 2.67 times than a smooth plate.

Abstract



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Original Research | Published: 21 October 2021

A multi-objective approach for renewable distributed generator unit's placement considering generation and load uncertainties

Kinjarapu Jayaram, Kollu Ravindra, K. R. K. V. Prasad & K. V. S. Ramachandra Murthy

International Journal of Energy and Environmental Engineering (2021)

Abstract

Penetration of Renewable distributed generation (RDG) units has increased in recent years due to increased environmental concerns and depleting fossil fuels. Deployment of RDG units will offer technical benefits such as loss minimization, bus voltage profile improvement, line loading reduction. Optimal allocation of RDG units is a challenging task as the generation is time-varying and uncertain in nature. In this work, optimal RDG allocation problem is formulated by considering time-varying and uncertain nature of generation and load demand using a Point estimate method (PEM)-based load flow with an objective to simultaneously minimize losses, improve voltage profile and reduce line loading. An efficient pareto front-based Multi-objective Backtracking search algorithm (PMBSA) is proposed in this work to

Funding

The authors received no specific funding for this work.

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K. R. K. V. Prasad & K. V. S. Ramachandra Murthy

Contributions

RK conceived the concept, framed the mathematical modeling and drafted the manuscript. KJ has done MATLAB programming, carried out data analysis to find PDF parameters and helped to formulate mathematical modeling. KRKVP checked the modeling, analyzed and substantiated the results, and helped in drafting the manuscript. KVSRM revised the manuscript and provided technical support.

Corresponding author

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Indonesian Journal of Electrical Engineering and Computer Science

The Indonesian Journal of Electrical Engineering and Computer Science (IJEECS), p-ISSN: 2502-4752, e-ISSN: 2502-4760 is a monthly peer-reviewed international journal in English, indexed by **Scopus** (CiteScore 2021: **2.4**, SNIP 2021: **0.513**, SJR 2021: **0.276**, Scimagojr Q3 on *Electrical and Electronic Engineering*, Q3 on *Computer Networks and Communications*, Q3 on *Signal Processing*, and Q3 on *Control and Optimization*), EI (INSPEC, IET), Google Scholar Metrics, ProQuest, EBSCO, BASE, Microsoft Academic, Scinapse, SHERPA/RoMEO, etc. The purpose of this publication is to disseminate high-quality articles that are devoted to discussing any and all elements of the most recent and noteworthy advancements in the fields of electrical engineering and computer science. The applications of telecommunications and information technology, applied computing and computer science, instrumentation and control engineering, electrical engineering (power), and electronics engineering are all included in its purview. To view the citation counts for this journal on Google Scholar, <click here>.

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Vol. 24, No. 2, November 2021, pp. 673~679
ISSN: 2502-4752, DOI: 10.11591/ijeecs.v24.i2.pp673-679

A series-connected switched source and an H-bridge based multilevel inverter

Siva Pachipala[1], Amarsrinadh Guda[2], Mentimi Sandeep Babu[3], Veeranarayana B.[4], K. V. S. Ramachandra Murthy[5], Abhilash Tirupathi[6]
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Article Info

Article history:

Received Jan 7, 2021
Revised Aug 30, 2021
Accepted Sep 17, 2021

Keywords:

H-bridge
Multilevel inverter
Pulse-width modulation

ABSTRACT

An inverter circuit is promoted in this paper, using series-connected switched dc sources along with an H-bridge circuit with optimized circuit elements like switching devices and diode clamped (DC) sources. This configuration uses DC supplies that can be strung together in series to create a significant voltage level. This topology consists of two parts, namely: 1) level production part and 2) polarity production part. The combination of some of the dc sources and switching devices completes the level production part. The H-bridge in the presented structure produces the polarity generation part. The DC-link capacitors are not needed in this design. There is a full presentation of the operating modes and modeling process of the proposed converter. Finally, in the MATLAB/SIMULINK setting the proposed topology is simulated and output current and voltage results have been examined.

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1. INTRODUCTION

Series-connected switched diode clamped-anode clamped (DC-AC) converters are highly flexible and modular in the family of multilevel inverters. In this group, "cascaded H-bridge (CHB)" converters 11]-[3] are the classical and traditional types. CHB converters have the advantages of equal voltage stress in symmetrical configurations, easy to add/remove the H-bridges to increase/decrease the number of output voltage levels. Multi-layer insulation (MLI) technology is spreading to several areas such as AC drives, static reactive compensators, micro-grid systems and renewable energy sources [4]-[6]. The "neutral point clamped (NPC)" or "diode clamped (DC)", "flying capacitor clamped (FCC)", and CHB converters [7]-[9] are established as standard topologies in the MLI family. In these configurations, the device count increases exponentially w.r.t the number of levels in the output voltage, the requirement of unequal voltage ratings of the clamping diodes, unequal capacitor size and a greater number of dc sources puts limitations on these topologies. Several new MLI configurations with the intention of avoiding the drawbacks in the standard topologies were proposed in the literature for several applications [10], [11]. In recent times, cascaded converters are attracting attention from industries as well as academia. Several such "voltage source inverters (VSIs)" were proposed in the literature [12]-[15] by employing several combinations of switches, DC power supplies. The converter has the advantages of reducing the number of components and reduced blocking voltage over the switching units to reduce the cost. In this configuration, the rest of the paper is arranged is being as: section 2 describes work and operating modes, section 3 presents the

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Vol. 10, No. 6, December 2021, pp. 2964~2971
ISSN: 2302-9285, DOI: 10.11591/eei.v10i6.2788

A single-phase simplified DC-AC converter using DC-link capacitors and an H-bridge

Sai Divya Sindhura Nunna[1], Akhilesh Ketha[2], Srivastav Sai Goud Padamat[3], K. Rambabu[4], Ujwala Anil Kshirsagar[5], Abhilash Tirupathi[6]
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Article Info

Article history:

Received Jan 9, 2021
Revised May 20, 2021
Accepted Oct 20, 2021

Keywords:

DC-AC converter
Hybrid structure
Multilevel inverter

ABSTRACT

This paper introduces a simplified inverter circuit using a single dc source and an H-bridge with a least possible number of "switching devices". This topology does not employ multiple "dc sources", which enhances the reliability of the configuration. The topology consists of two parts, namely: "Level generation parts" as well as "Polarity generation parts", it is the mixture of some of the switching devices, DC-link capacitor and a single DC source completes the part of level generation. The H-bridge in the proposed structure produces the polarity generation part. A detailed explanation of the modulation system and operating modes of the proposed framework are discussed. Finally, in the MATLAB/SIMULINK platform, the projected network topology is simulated and the outcomes are presented.

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1. INTRODUCTION

Single-phase DC-AC converters are predominant in several industrial and household applications like lathe machines, centrifugal pumps, uninterrupted power supplies, etc. Multilevel single-phase DC-AC converters are highly attractive than two-level inverters due to the advantages of higher power rating, improved power quality and higher reliability. In this context, cascaded converters are highly flexible and modular in the family of multilevel inverters. In this group, "cascaded H-bridge (CHB)" converters [1]-[4] are the classical and traditional types. CHB converters have the advantages of equal voltage stress in symmetrical configurations, easy to add/remove the H-bridges to increase/decrease the voltage levels in the output. MLI technology is spreading to several areas such as AC drives, static reactive compensators, micro-grid systems and renewable energy sources [5]-[8]. The "Flying capacitors clamped (FCC)", "neutral point clamped (NPC)" and "CHB converters" [9]-[11] are established as normal topologies in the MLI family. In this configurations, the device count increases exponentially in reference to the increased in the voltage levels of output. The requirement of unequal voltage ratings of the clamping diodes, unequal capacitor size and a greater number of dc sources puts limitations on these topologies. Several new MLI configurations with the intention of avoiding the drawbacks in the standard topologies were proposed in the literature for several applications [12]-[16]. In recent times, cascaded converters are attracting attention from industries as well as

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An Efficient Covid19 Epidemic Analysis and Prediction Model Using Machine Learning Algorithms

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DOI: https://doi.org/10.3991/ijoe.v17i11.25209

Keywords: Covid19, Kaggle, machine learning, Regression

ABSTRACT

The whole world is experiencing a novel infection called Coronavirus brought about by a Covid since 2019. The main concern about this disease is the absence of proficient authentic medicine The World Health Organization (WHO) proposed a few precautionary measures to manage the spread of illness and to lessen the defilement in this manner decreasing cases. In this paper, we analyzed the Coronavirus dataset accessible in Kaggle. The past contributions from a few researchers of comparative work covered a limited number of days. Our paper used the covid19 data till May 2021. The number of confirmed cases, recovered cases, and death cases are considered for analysis. The corona cases are analyzed in a daily, weekly manner to get insight into the dataset. After extensive analysis, we proposed machine learning regressors for covid 19 predictions. We applied linear regression, polynomial regression, Decision Tree Regressor, Random Forest Regressor. Decision Tree and Random Forest given an r-square value of 0.99. We also predicted future cases with these four algorithms. We can able to predict future cases better with the polynomial regression technique. This prediction can help to take preventive measures to control covid19 in near future. All the experiments are conducted with python language

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Assessing the potential of xanthan gum to modify in-situ soil as baseliners for landfills

S. Anandha Kumar & E. R. Sujatha

International Journal of Environmental Science and Technology (2021)

Abstract

Bentonite clay is most commonly used as a landfill liner but is resource-intensive and suffers drawbacks like large volume change and desiccation cracking. It also poses construction difficulties and the handling of a large volume of material. In situ soil can be successfully modified into base liners for landfills which offers an economical and sustainable alternative to bentonite liners. In this study, an exocellular biopolymer, xanthan gum, is used to improve the in situ soil and provides a novel alternative liner material. A comparative study is also made by modifying the in situ soil with various percentage of bentonite. The results show that the maximum dry density of the in situ soil increased marginally for both the additives. Hydraulic conductivity decreased from 2.87×10^{-3} to 4.46×10^{-8} cm/s at 1% xanthan gum addition while in case of bentonite it reduces to

and evaluation of heavy metals removal from landfill leachate by pleurotus ostreatus. Waste Biomass Valoriz 9(3):503–511. https://doi.org/10.1007/s12649-017-0015-x

Wen K, Li Y, Huang W, Armwood C, Amini F, Li L (2019) Mechanical behaviors of hydrogel-impregnated sand. Constr Build Mater 207:174–180. https://doi.org/10.1016/j.conbuildmat.2019.02.141

Acknowledgements

The authors thank the Vice Chancellor of the SASTRA Deemed University, Thanjavur, for the support and the infrastructure facilities provided during this study. The authors thank the anonymous reviewer and the editor for their time and effort in helping us improve the manuscript.

Funding

No funding was received for conducting this study.

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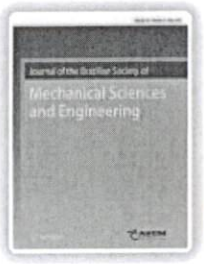

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Journal of the Brazilian Society of Mechanical Sciences and Engineering (2021) 43:369
https://doi.org/10.1007/s40430-021-03082-6

TECHNICAL PAPER

Effect of welding current in TIG welding 304L steel on temperature distribution, microstructure and mechanical properties

Pramod Kumar[1,3] · Amar Nath Sinha[3] · Chetan Kumar Hirwani[3] · M. Murugan[1] · A. Saravanan[2] · Akhilesh Kumar Singh[1]

Received: 1 July 2020 / Accepted: 18 June 2021 / Published online: 2 July 2021

Abstract

In the current research work, austenitic stainless steel 304L of 1.4-mm thin sheet has been butt welded using TIG welding process. The influence of welding current in TIG welding of 304L stainless steel on temperature distribution, microstructure and mechanical properties of the welded joint has been investigated. The microstructure and mechanical properties of TIG welded specimens at varying welding current (20–120A) and constant welding speed and voltage have been explored. The influence of welding current on the weld zone temperature variation was investigated. The microstructures of the FZ, HAZ and base metal have been studied and compared at varying welding current. The mechanical properties such as micro-hardness, bending stress and tensile strength of the welded joints at varying welding current have also been investigated. The phases of the FZ were also studied by XRD analysis. Tensile test of welded specimens and parent metal has been carried out for measuring UTS and percentage elongation. Surface morphology for the fractured samples during tensile test has also been examined.

Keywords Temperature distribution · 304L · Micro-hardness · Welding current · Microstructure · XRD

List of symbols

T	Temperature (K)
ρ	Density (kg/mm^3)
v	Welding speed (mm/s)
c	Specific heat (J/kg k)
k	Thermal conductivity (W/mm k)
Q_t	Heat generated per unit volume (J/mm^3)
T_0	Room temperature (303 K)
ε	Emissivity (0.6)
σ	Stefan-Boltzmann constant
h	Natural convection heat coefficient
q_f	Fraction of the heat deposited in the front quadrant
q_r	Fraction of the heat deposited in the rear quadrant
b_f	Front ellipsoid parameter
b_r	Rear ellipsoid parameter
a	Width of the profile
b	Depth of the profile

Abbreviations

HAZ	Heat-affected zone
FZ	Fusion zone
XRD	X-ray diffraction
FESEM	Field emission scanning electron microscope
UTS	Ultimate tensile strength
TIG	Tungsten inert gas
BCC	Body-centered cubic
CFD	Computational fluid dynamics
APDL	ANSYS parametric design language
GTAW	Gas tungsten arc welding
DCEN	Direct current electrode negative
SMAW	Shield metal arc welding
MAG	Metal active gas
EDX	Energy-dispersive X-ray
FEM	Finite element method
ASTM	American Society for Testing and Materials

Technical Editor: Monica Carvalho.

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Volume 620, 1 November 2021, 413264

Evaluation of micro-structural and magnetic properties of nickel nano-ferrite and Mn^{2+} substituted nickel nano-ferrite

J. Suresh [a], B. Trinadh [a], B. Vikram Babu [b], P.V.S.S.S.N. Reddy [c], B. Sathish Mohan [d], A. Rama Krishna [e], K. Samatha [a]

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Received 6 May 2021, Revised 5 July 2021, Accepted 8 July 2021, Available online 12 July 2021, Version of Record 22 July 2021.

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Highlights

- Mn^{2+} Substituted Nickel Nano-Ferrite is reported in this manuscript.
- Saturation magnetization and magnetic moment of the $NiFe_2O_4$ is lower than $Ni_{0.7}Mn_{0.3}Fe_2O_4$.
- Lattice parameter value and volume of unit cell rises with manganese substitution.
- Cation distribution indicates that the Ni^{2+} ions inhabit B-sites and Mn^{2+} ions dwell in tetrahedral A-spot and the Mn^{2+} ions swap Ni^{2+} from tetrahedral spot.

Abstract

The spinel ferrites have remarkable applications in electronic technology owing to their elevated saturation magnetization, steadiness, resistivity and little loss energy over a broad array of frequencies. The features with respect to structure and magnetism of manganese doped $NiFe_2O_4$ nano ferrite are extensively probed.

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Investigation into Machining Accuracy of Micro Circular Pattern Fabricated by Maskless Electrochemical Micromachining

S. Kunar[1,*], A. P. Tiwary[2], G. Kibria[3] and Bh. V. Prasad[1]

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Received 07 March 2021; Accepted 22 August 2021

Abstract

Micro circular pattern defines the crucial performance of many micro-industrial components and micro-products. The dimensions, surface quality and location of micro circular pattern directly influence the product life. In maskless electrochemical micromachining (EMM), the maskless substrates are used for the manufacture of many impressions with insulated micro circular patterned tool. One textured tool produces more than twenty-three machined samples. This method is successfully utilized to produce multiple the dimple patterns because of its important benefits like stress and crack free surfaces, material independent of hardness, reusability of the tool and ability to cut the material irrespective of the hardness. The maskless EMM has some distinctive benefits i.e., less machining time and inexpensive. In this paper, the outcome of process variables i.e., electrolyte concentration and frequency on the machining accuracy and depth is investigated. Higher electrolyte concentration and lower pulsed frequency increase the overcut. The combination of lower electrolyte concentration and higher frequency is recommended for high machining accuracy.

Keywords: EMM, micro circular pattern, machining accuracy, overcut, depth

1. Introduction

Micropatterned surfaces characterize the advancement of micromachining technology for enhancing the performance of manufacturing components. These surfaces can change the thermal, tribological, etc. properties. Many reviewers have evaluated their theories on micro-texturing and microtextured techniques [1-2]. Various types of microscopic effect can be obtained by the different microscopic mechanisms. Surface microtextures retain the lubricating substances in micro-impression and act as lubricant reservoirs. These micro-textures reduce the shear stress in lubricated mating elements. Menezes et al. [3] shows the micro-features of micro-circular pattern used in many engineering fields and applied to the development of tribological properties of automobile components.

Various micro-texturing techniques i.e., abrasive jet machining, laser machining, electro-discharge machining, electrochemical machining, etc. are used for fabrication of different textures. Bao et al. [4], Rajurkar et al. [5] and Zhu et al. [6] presents that electrochemical machining is an advanced machining technique due to several benefits i.e., tool wear, free from residual stresses, cracks and burrs and inexpensive compared to other methods. Electrochemical machining method can dissolve the material by maskless or through-mask method. Natsu et al. [7] proposed the electrolyte jet machining for the generation of dimple pattern with 300μm in diameter. Nouraeiz et al. [8] presents the maskless EMM process in which the anode is kept near to the cathode for generation of my micropattern. Costa et al. [9] uses maskless electrochemical texturing method for generation of dimple arrays with diameter of 220μm. Byun et al. [10] proposes the micro- electrochemical machining technique for fabrication of micro-circular patterns with a tool electrode diameter of 275μm. But it takes more time for individual workpiece fabrication. Kunar et al. [11] fabricates surface structures in different phases to envisage the effect of EMM process variables on the dimple pattern. Thanigaivelan et al. [12] presents the effect of process inputs on overcut using electrochemical micromachining. Mahata et al. [13] uses through-mask electro-chemical micromachining to study the influence of duty ratio on other surface properties and overcut utilizing very thin mask. Kunar et al. [14] shows the impact of EMM process inputs on depth and overcut of dimple pattern have investigated.

The micro circular patterned surface is described by its various arithmetical properties i.e. shape, size, etc. All geometrical properties have lots of significance in tribological applications. Therefore, accurate micro-circular pattern generation is very important factor for the tribological purpose.

A novel method of maskless electrochemical micromachining technique, involving micropattern transfer without maskless workpieces, has been planned for the fabrication of micro-circular pattern with enhanced surface quality using developed electrochemical micromachining system, electrochemical micromachining cell with vertical cross flow system and EMM setup. One masked patterned tool can produce numerous micro-circular patterns. The purpose of the research paper is to explore the influence of process input, especially the influence of electrolyte concentration and pulse frequency on machining accuracy.

2. Experimental procedure

The developed setup consists of different sub-components i.e., pulsed power unit, electrolyte flow scheme, machining

*E-mail address: sandip.sandip.kunar@gmail.com
ISSN: 1791-2377
doi:10.25103/jestr.144.13

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Research articles

Micro-structural, dielectrical and magnetic properties of Cu^{2+} substituted $Ni_{0.7}Mn_{0.3-x}Cu_xFe_2O_4$ ($x = 0.0, 0.05, 0.1, 0.15$ and 0.2) nano-ferrites

J. Suresh [a], B. Trinadh [a], B. Vikram Babu [b], P.V.S.S.S.N. Reddy [c], A. Rama Krishna [d], B. Sathish Mohan [e], Ramu Yarra [c, f], K. Samatha [a]

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Received 30 June 2021, Revised 3 August 2021, Accepted 23 August 2021, Available online 26 August 2021, Version of Record 1 September 2021.

https://doi.org/10.1016/j.jmmm.2021.168464

Abstract

The nano-ferrites with chemical formula $Ni_{0.7}Mn_{0.3-x}Cu_xFe_2O_4$ having x between 0.0 and 0.2 were prepared by sol-gel auto-combustion process. The XRD pattern presents quite a good evidence for the formation of ferrite spinel phase in all the prepared samples. The broad lines indicate that the particles are of nano-size. The SEM studies reveal about the uniformity and crystallinity of the materials and also the spherical shape of the grains. Rise in copper density leads to fall in dielectric constant (ε_r) due to the relocation of Fe^{3+} from B-position to A-position. The dielectric loss (tan δ) maxima location swings towards the lower frequency as composition of dopant rises. The saturation magnetization and net magnetic moment decline with rise in Cu composition. The ESR technique ropes the subsistence of non collinear magnetic structure as predicted by VSM measurements.

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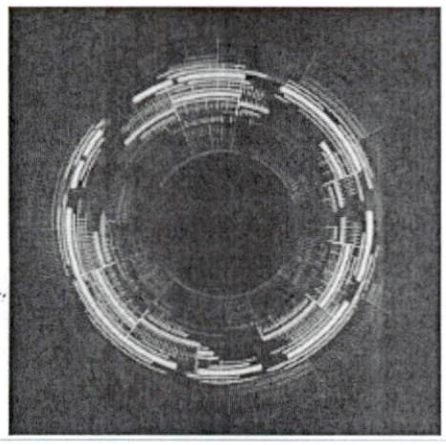

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Proposing a reliable method of securing and verifying the credentials of graduates through blockchain

T. Rama Reddy[1*], P. V. G. D. Prasad Reddy[2], Rayudu Srinivas[1], Ch. V. Raghavendran[3], R. V. S. Lalitha[3] and B. Annapurna[4]

Abstract

Education acts as a soul in the overall societal development, in one way or the other. Aspirants, who gain their degrees genuinely, will help society with their knowledge and skills. But, on the other side of the coin, the problem of fake certificates is alarming and worrying. It has been prevalent in different forms from paper-based dummy certificates to replicas backed with database tampering and has increased to astronomic levels in this digital era. In this regard, an overlay mechanism using blockchain technology is proposed to store the genuine certificates in digital form and verify them firmly whenever needed without delay. The proposed system makes sure that the certificates, once verified, can be present online in an immutable form for further reference and provides a tamper-proof concealment to the existing certification system. To confirm the credibility of the proposed method, a prototype of blockchain-based credential securing and verification system is developed in ethereum test network. The implementation and test results show that it is a secure and feasible solution to online credential management system.

Keywords: Tamper-proof digital certificates, DAPPs, Credential verification, Etherium, Blockchain

1 Introduction

As technology is advancing, the creation of fake certificates becomes easier. The forged certificates range from fake universities issuing certificates to forged certificates of existing reputed universities. Due to centralization and digitalization, this fake credentials problem became pain in the neck for both the universities and recruiting organizations, and it needs to be addressed with a sharp solution. According to CareerBuilder (https://resources.careerbuilder.com/recruiting-solutions/how-much-is-that-bad-hire-costing-your-business), a company can lose 15,000 dollars on average, for a wrong hire or for hiring someone with a fake qualification. The loss is not just financial but may also cost the lives of innocent people because of the constructions designed by fake engineers and treatment given by fake doctors. Validating the certificates properly before taking someone into an organization is the key to solve this hitch. The primary cause of this problem is that credential verification is not as easy as it is seems. It takes a lot of resources, time, and money as well.

Blockchain technology helps us in building a decentralized application that keeps all the data secure and tamper-free. In this application, the data is stored in text format to ease the implementation and testing, but once the transaction is done, the data is converted into hash values and stored in the block within the entire network. This provides security since a single bit of modification in a block should tamper all the data in the entire chain which is not possible because multiple copies are distributed in the peer network. So the integrity of the data is maintained. The proposed method is implemented and tested using ethereum test net. Whenever some data is

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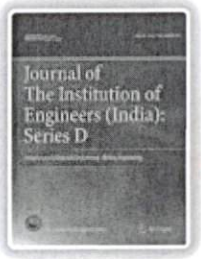

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J. Inst. Eng. India Ser. D (July–December 2021) 102(2):495–504
https://doi.org/10.1007/s40033-021-00290-1

ORIGINAL CONTRIBUTION

Safety Risk Assessment and Risk Prediction in Underground Coal Mines Using Machine Learning Techniques

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Received: 18 May 2021 / Accepted: 6 September 2021 / Published online: 7 October 2021

Abstract Risk management focusses on the identification of uncertainties and its impacts associated with various functional activities carried out to achieve various mandates, goals and objectives of the company. To assess the risk level (as 'very high', 'high', 'medium' or 'low'), consequences and likelihood analysis are to be done based on the judgmental knowledge and experiences of the participants. The traditional methods of risk classification are time consuming and laborious if the inputs are voluminous. In this study, the hazards occurring in different sections of underground mining have been categorized, and associated risks have been predicted using different machine learning modelling techniques, namely KNN, SVM, logistic regression and decision tree by keeping the prescribed guidelines of the DGMS intact and using it as the basic building blocks to model the machine learning classification models.

Keywords Risk assessment · Risk classification · Coal mines · K nearest neighbours (KNN) · Decision tree · Support Vector Machine (SVM) and Logistic Regression

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Introduction

The mining industry exists with hazardous operations and arduous work environment that involve potential safety, environmental, and health risk to the miners. For the mining industry to be successful besides meeting the production requirement, it is also important to consider the safety and health of the workers as a prime concern. Unsafe conditions and acts in surface and underground mines lead to a significant number of accidents/disasters causing loss of human lives, injuries, damage to the property, affecting the production, etc.

A careful assessment of possible events that can happen in certain circumstances allows the controlled risk monitoring and the building of a proper risk management plan. A proper risk management plan minimizes the possibility of unexpected events and their impacts. It helps in the mapping of adverse events and detecting them even before they happen.

Risk management focusses on the identification of uncertainties and its impact associated with various functional activities carried out to achieve various mandates, goals, and objectives of the company. To assess the risk level (as 'very high', 'high', 'medium' or 'low'), consequences and likelihood analysis need to be done based on the judgmental knowledge and experiences of the participants. It would present the major risks associated with all the activities of the company and prioritize risks for the company along with some suggestions on mitigation measures.

Following are the points to ponder about risk management of an organisation:

- *Identifying risks* involving the identification of uncertainties based on the functional areas of the

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A novel compact fractal UWB antenna with dual band notched characteristics

V. N. Koteswara Rao Devana, Vella Satyanarayana, A. Vijaya Lakshmi, Y. Sukanya, Ch. Manohar Kumar, V. L. N. Phani Ponnapalli & Kamili Jagadeesh Babu

Analog Integrated Circuits and Signal Processing
110, 349–360 (2022)

A Correction to this article was published on 08 December 2021

This article has been updated

Abstract

A very compact dual band notched fractal structured antenna is proposed for UWB applications. A novel fractal patch with defected ground structure is utilized to achieve −10 dB bandwidth of 7.87 GHz from 3.77 GHz to 11.64 GHz. To notch upper WLAN band of 5.52–5.90 GHz, an S- shaped slot is introduced in the 50 Ω microstrip feed line. The X- band notch for down link of satellite communication applications from 7.22–8.16 GHz is achieved by two symmetrical L-structured parasitics on both sides of fractal patch. The proposed antenna having a compact size of 16

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Appreciation of "*Morning Bells*" by Jayashree Mohanraj

1. V. Jayasri Suma, 2. J. Bala Rajasekhar, 3.Y. Manjula 4. Dr. M. Sandra Carmel Sophia
1. Asst.Prof of English, 2. Asst.Prof of English, 3. Asst.Prof of English, 4. Prof of English Humanities & Basic Sciences
Aditya Engineering College (A), Kakinada, India

ABSTRACT:

Jayshree Mohanraj is one of the most remembered writers of Andhra Pradesh in special and India in general. A multilingual translator, Jayshree Mohan Raj possessed the gift of translating poems from vernacular languages to English. As an experienced writer, Mohan Raj has captured the attention of the readers through her short stories, poems and Fiction in which she paints pictures of problems of middle class families. Her writings are very effective and inspiring as she narrates stories from her real life experiences. Her stories deal with realistic themes of predicament of children, situation of women, class conflict, and etc. '*Morning Bells'* is a very good example of a story which deals with four children who experience poverty and squalor because they have been cast away from home due to poor economic conditions.

KEY WORDS: Multilingual, translator, vernacular, middle class, problems, realistic, predicament.

INTRODUCTION

Jayashree Mohan raj hails from middle class family. Her life experiences left a great impact on her writings and very courageously Mohan raj presented the problems faced by middle class men, women and children. Mohan raj is a talented Indian writer of Short stories and a creative writer who has made a fine mark on the reader's mind at the global level.

THE STORY IN A NUT SHELL:

The present story titled *"Morning Bells*" is an honest presentation of small children who are deprived of food, clothing, shelter and basic necessities of life because they have been orphaned when they were kids. The story is about four rag pickers which provide deep insights into the hypocrisy of the aristocratic. Chotu, Ramu, Irfan and Munna are rag pickers. Who roam in the streets groping for garbage in public dustbins .Every day the routine goes on for the small boys and without any unhappiness or sorrow, the four boys go about their business of rag picking as they have no other choice. They enjoy doing the menial job as a gift from God and picked up objects which they discovered will give them some money. Each boy has his own story which is so painful. The boys have experienced pathetic situations like beatings and scolding of a drunken father, harassment of stepmother, physical abuse by the hotel proprietor, etc in their childhood. They believe that God's providence has brought them together. All four of them once met at a dumping yard and started to live together.

One day the four boys happened to come across the huge garbage bin. Their joy knew no bounds. All four of them quickly go near the garbage and to their astonishment; a swarm of flies rose up in the air. After searching poignantly in the bin, Chotu felt something soft and tender in his hands. He was shocked to see a dead infant. Without any second thought, Chotu calls Ramu and points at the lumpy thing inside the bin. Then both of them pick up the small bundle only to discover that it was a female infant. They wrapped the baby in an old newspaper and took it home along with them.

On the way to their shed, the four boys stopped at the temple. There they came across people of all classes and communities entering the temple. The author describes the temple goers adorned with bright vermilion marks and carrying the necessary things to be placed at the altar. Some of the temple goers displayed true devotion and

Elementary Education Online
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doi: 10.17051/ilkonline.2021.05.811

FEMALE EMPOWERMENT THROUGH ECOLOGICAL RESTORATION AND PRESERVATION (ANALYSIS OF WANGARI MAATHAI'S UNBOWED)

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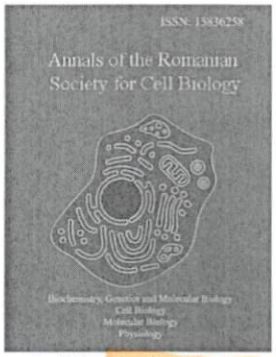
ABSTRACT- This article explores the kinship between women and environment projected by women writers in World literatures in general and African literature in particular. These writers have established a space to discuss the politics of gender, modernity, environmental issues and changes in Africa to articulate a culturally-located discourse of development. Women writers have taught women to stand up for themselves and what they believe in. Through their works of prose fiction they have been able to show women as important part of them that should voice out and not drown in the patriarchal abyss as society expects. Thus women writers during the twenty five years have made a significant contribution. Eventually the works of women writers underwent rapid changes and have steadily risen in quantity and quality. Women writers invite the readers to re-imagine and re-vision the truth that living ethically, beautifully well with human and the environment is necessary. They focus on the poignant aspects of protecting the environment and all creatures which share the ecosystem. Each of their writings has changed the way that ordinary human being perceives the world. Women writers have also shown that women have an effect on the health of the planet beginning from the smallest decisions of day-to-day lives to international policy through which each can make a difference to protect the planet. Thus women writers have offered a different mirror of their own while dealing with the themes of environment, female empowerment and ecological concerns. They may be titled as 'Guardians of the Planet'.

KEYWORDS: African Literature, Women, Environment, Feminism, Gender Equality, Re-imagine, Re-vision, Ecosystem, Female Empowerment, Preservation.

I. INTRODUCTION

Women Writers in Africa have established themselves in the sixteenth century after undergoing much struggle. The truth applies more to women writers who were unnoticed as serious writers. It is subsumed under the massive humming and bustling of her male counterpart who have taken women for granted. Thus women writers during the twenty five years have made a significant contribution to literature. Eventually the works of women writers underwent rapid changes and have steadily risen. Black women novelists are meditating on recreating and restoring the stereotyped images of women with a view to project a different picture. Women writers have focused to depict women who are empowered and try to seek a balance between the family and the natural world. Helen Chukwuma expresses;

> The identification of male positive disposition to the cause of women is a healthy development for African Literature. Firstly, it underscores the validity of women's complaint of subjugation and negative exposure. Secondly, it compliments and advances literature from the continent. With such unison of voice, the real essence of African Literature is brought to the fore and appreciated (Chukwuma 1990: 113).



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Histological aspects of the esophagus at Chinchilla (Chinchilla lanigera)

From three clinically solid Chinchilla guys butchered by the proprietor for their hide, were gathered throat pieces having a place with the three unique regions: cervical, thoracic and stomach. The tissue pieces were handled by the paraffin incorporation strategy so as to perform histological examination. In each of the three distinct fragments, the esophageal mucosa is spoken to by a separated squamous epithelium with a granular layer twice as evolved contrasted and the spinosum layer and with a medium level of surface keratinization. Muscularis of the mucosa is all around spoke to and present in every one of the three fragments, with an attentive thickening inclination from the cervical to the stomach portion. It is arranged on a solitary layer and is framed from smooth muscle cells with longitudinal orientation.

The antioxidants are not enough. Malus sylvestris (L.) Mill. extract enhances the carbon tetrachloride liver toxicity in albino rats

Liver toxicosis prompted by CCl4 presentation is an authoritative model for steatohepatitis. Cancer prevention agents are as often as possible utilized for hepatoprotection yet now and again they have no advantageous impact dependent on the prooxidant properties or lattice harmfulness. Four exploratory gatherings (Control, Extract, CCl4 and CCl4 + Extract) of pale skinned person rodents were utilized so as to assess the impact of the hydroglycerin alcoholic Malus sylvestris (L.) Mill. separate in CCl4-prompted steatohepatitis. Blood transaminases and TNF? were expanded after CCl4 organization and cell-interceded provocative reaction was improved similarly with transaminases and TNF?.

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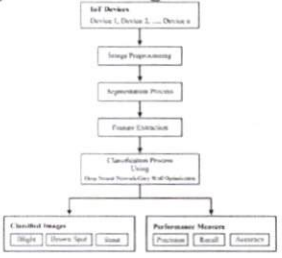

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Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 10543 - 10549
Received 05 March 2021; Accepted 01 April 2021.

Creating Awareness and Importance of 'English' For Students Hailing From Rural Areas

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Abstract

The ever-growing need for good communication skills in English creates a huge demand for English learning/teaching around the world. People's participation in dialogue of cultures requires communication and contributes to the total holistic formation of the human person. English education is the need of the hour and a powerful instrument of economic, social and cultural change. In underdeveloped countries like India, the progress of rural areas is questioned, because of unequal or lack of access to quality education. Poverty and illiteracy remain overwhelmingly a rural phenomena and poverty in rural areas is linked to illiteracy. Therefore development in rural areas faces a key challenge to achieve both poverty reduction and 'Education for All'. Quality of education depends on infrastructure such as classrooms, sanitation facilities, provision for digital learning, sports equipment facilities, professional competencies of teachers, access to books and learning materials, So the article is a discussion on the importance and creating awareness of English education for students hailing from rural areas since it is the powerful instrument of economic, social and cultural change.

Keywords: Communication, English Language, Dialogue of Cultures, Holistic Formation, Quality Education, English Education, Instrument of Social Change, Cultural Change.

Introduction:

Mankind has failed to get rid of poverty and squalor in the world despite tremendous growth in world incomes and unparalleled improvements in standards of living over the past few years. As a consequence, people are facing countless problems in countries like India particularly in rural areas and under developed regions. The major reason for this happens to be inequalities and injustice affecting the lives of the rural poor. Unequal access to quality education or lack of

International Journal of Aquatic Science
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Vol 12, Issue 02, 2021

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"The Problems Faced By The Rural Students In Conversing In English And Proposed Solutions To Develop Their Communication Skills"

B.Rambabu[1], Dr. Siva Nagaiah Bolleddu[2], S.A.N.A Mashahaddi[3]

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ABSTRACT: ***This paper reflects on the difficulties of speaking English in India's rural areas. Teaching policies are a social concern and also a personal challenge in Indian schools and universities. In most Indian schools and universities, the quality of English Language education paints an alarming picture. Teachers' language skills, language exposure, and materials are also big issues when it comes to the level of English language instruction. In fact, rural students face many challenges because they lack the ability to communicate in English with their classmates, classmates, and family members, as well as access to language proficiency labs, audiovisual aids, and other resources. In general, rural students consider English as a subject rather than an ability. This is their most difficult task. Students can only improve their level of proficiency if they study it as a language. The bulk of students prep exclusively for the exam. They aren't known for their ability to read poetry, but they are adept at memorising it. English is feared by rural students. Many professors, on the other hand, lack a long-term perspective on student life. They're solely concerned with analysis. Other language classroom interventions, such as metacognitive techniques, incentives, and coping methods, are recommended in the study to help students improve their language skills.***

Key Words:Metacognitive, Vernacular, Competence, Concentrates, Formulate, Mispractice.

Mend your speech a little,
Lest it may mar your fortune

-----William Shakespeare

1. INTRODUCTION

English is known as the "Queen of Languages" because it is a global language. It is thought to be a one-of-a-kind language. It is spoken as a mother tongue by over 450 million people.

Indian Journal of Ecology
Year : 2020, Volume : 47, Issue : 4
First page : (902) Last page : (909)
Print ISSN : 0304-5250.

Development of different irrigation systems calculator using VB6

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Online published on 9 March, 2021.

Abstract

A computer program has been developed for design of surface and pressurized irrigation systems. The program includes two main parts: crop water requirements and hydraulic calculations of the system. It has been developed in Visual Basic 6.0 and gives opportunity for selecting some parameters from tables such as: agro-physical soil properties, characteristics of the corresponding crop, climatic data. It allows the user of the program to assume and set a definite value, for example the emitter discharge, plot parameters and etc. It includes the design of lateral, manifold, main line and pump calculations. The program has been compiled to work in Windows. This software is userfriendly and provides interaction at all stages of the design process and a solution based on individual's requirements and the information base available within the software. The individual not only can suit to his requirement but can also compare his design with several other alternate designs with different inputs. Design of system arrived by this software was tested with manual calculations at developer's level and results were found satisfactory.

Keywords

Visual basic 6.0, Crop water requirement, Surface irrigation system, Pressurized irrigation systems.

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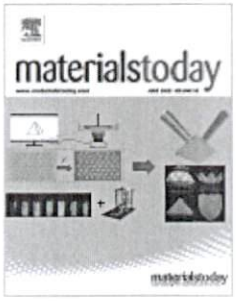

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ISSN

ScienceDirect

Ceramics International
Volume 48, Issue 5, 1 March 2022, Pages 6808-6818

Influence of steel and PP fibers on mechanical and microstructural properties of fly ash-GGBFS based geopolymer composites

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Received 23 September 2021, Revised 12 November 2021, Accepted 23 November 2021, Available online 2 December 2021, Version of Record 5 February 2022.

https://doi.org/10.1016/j.ceramint.2021.11.232

Abstract

In this study, experimental investigations were carried out to estimate the mechanical and microstructural properties of polypropylene (PP) and steel fiber reinforced geopolymer mortar. Two industrial by-products are used as binders to produce the geopolymer composites, i.e., fly ash (FA) and ground granulated blast furnace slag (GGBFS). Different percentages of PP and steel fibers are used in geopolymer mortars to find the mechanical properties such as compressive, splitting tensile and flexural strengths were investigated to understand the strength behavior. However, the compressive elastic modulus values were estimated through the proposed equation based on the compressive strength of the fiber reinforced geopolymer composite samples. Moreover, to understand the geopolymeic reaction, microstructural studies, i.e., scanning electron microscopy (SEM), were conducted. The experimental results revealed that the addition of PP fibers up to 2.0% (volume fraction) enhanced the flexural properties of geopolymer mortar samples. The compressive strength of the steel fiber-reinforced geopolymer composite reached a maximum of 2.5% volume fraction, being a 13.26% improvement over the control mix. The flexural toughness index of the PP and steel fiber reinforced composites improved with increasing the fraction. However, steel fiber reinforced geopolymer samples are shown better flexural toughness compared to PP fibers. The SEM analysis of the geopolymer control mix achieved a good degree of geopolymerization and both the fibers yielded a considerable interfacial bonding with the geopolymer paste.

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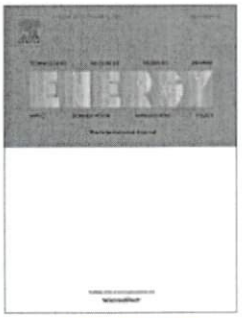

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Energy
Volume 242, 1 March 2022, 122910

Direct utilization of preheated deep fried oil in an indirect injection compression ignition engine with waste heat recovery framework

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Received 28 July 2020, Revised 14 November 2021, Accepted 11 December 2021, Available online 18 December 2021, Version of Record 3 January 2022.

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https://doi.org/10.1016/j.energy.2021.122910

Highlights

- Sunflower Oil based Deep Fried Oil (DFO) is identified as a novel feed stock.
- Preheating the DFO to 130 °C shown performance nearby diesel operation.
- Performance, emissions and combustion analysis was carried out.
- FFA analysis was carried out on virgin sunflower oil and sunflower oil based DFO and discussed.
- Combustion analysis instrumentation associated with IDI CI engine was discussed.

Abstract

The ever-growing use and expense of fossil fuels have prompted the planet to quest for alternatives to environmental issues. Efforts are being made worldwide to extract alternative fuels from more than 400 plant species for both edible and non-edible oils. Being edible oils consuming by the human race, this

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Volume 8, Issue 2, June 2022, Pages 244-249

An optimized technique for copy–move forgery localization using statistical features

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Received 22 March 2021, Revised 7 May 2021, Accepted 11 August 2021, Available online 26 August 2021, Version of Record 1 June 2022.

https://doi.org/10.1016/j.icte.2021.08.016

Abstract

Copy–Move Forgery Detection (CMFD) helps to detect copied and pasted areas in one image. It plays a crucial role in legal evidence, forensic investigation, defence, and many more places. In the proposed CMFD method, a two-step identification of forgery is presented. In step one, the suspected image will be classified into either one of two classes that are forged or authentic. Step two is carried out only if the suspected is classified as forged, then forged location will be identified using the block-matching procedure. Initially, the suspected image is decomposed into different orientations using Steerable Pyramid Transform (SPT); Grey Level Co-occurrence Matrix (GLCM) features are extracted from each orientation. These features are used to train Optimized Support Vector Machine (OSVM) as well as to classify. If the suspected image is categorized into forged, then the suspected grey image is converted into overlapping blocks, and from each block, GLCM features are extracted. The proper similarity threshold value and distance threshold value can locate the forged region using GLCM block features. The performance of the proposed method is tested using standard datasets CoMoFoD and CASIA Datasets. The proposed CMFD approach results are consistent, even the forged image suffered from attacks like JPEG compression, scaling, and rotation. The OSVM classifier is showing superiority over the Optimized Naive Bayes Classifier (ONBC), Extreme Learning Machine (ELM) and Support Vector Machine (SVM).

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Sustainable Energy Technologies and Assessments
Volume 49, February 2022, 101644

Design of MFA-PSO based fractional order PID controller for effective torque controlled BLDC motor

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Received 18 February 2021, Revised 22 June 2021, Accepted 5 October 2021, Available online 19 November 2021, Version of Record 19 November 2021.

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https://doi.org/10.1016/j.seta.2021.101644

Abstract

This paper presents an effective torque and speed regulation strategy for BLDC motor (BLDCM) using Modified Firefly Algorithm (MFA)–Particle Swarm Optimization (PSO) based Fractional Order PID (FOPID) controller. Due to simplicity and better steady state performance, typical PID controllers are used to control the BLDC motors. However, due to load variations, it has an issue with uncertainty. The PID controller tuning also contributes to uncertainty in the parameters of the structure. With the help of the FOPID controller, accurate control method can be provided to overcome the above problems. A combination of MFA and PSO algorithms are employed to tune the FOPID parameters. Simulations of proposed MFA-PSO based FOPID controller for BLDC speed are carrying away in Matlab/Simulink atmosphere. To authenticate the applicability of proposed controller for BLDC motor, the consequences are compared through Genetic Algorithm (GA), Firefly Algorithm (FA) and Firefly-Artificial Neural Network (ANN) based FOPID controllers.

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Keywords

Torque; BLDCM; MFA; PSO; PID; FOPID; GA; FA; ANN

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Load Balancing in RPL to Avoid Hotspot Problem for Improving Data Aggregation in IoT

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Abstract: Data aggregation plays a vital role in the Internet of Things (IoT), and it aggregates the collected sensor data from devices to suppress redundant data transmissions. Many-to-one traffic pattern in the IoT induces hotspot problem and inefficient data aggregation. The Routing protocol for low-power and lossy networks (RPL) in the network layer impacts the hotspot problem due to the frequent usage of forwarding nodes and load imbalance. The processes of network layer protocol, such as trickle algorithm and Objective Functions (OF) for Destination Oriented Directed Acyclic Graph (DODAG) construction, need more attention to avoid hotspot for efficient data aggregation. This work proposes a Load Balanced RPL (LoB-RPL) protocol to avoid hotspot creation using a composite metric based parent selection, DODAG construction, and local topology adaptive decision on trickle parameters. The LoB-RPL improves the Minimum Hop with Hysteresis Objective Function(MRHOF) using the composite metric based parent selection and tunes the parameters of the Trickle algorithm. It ensures efficient maintenance of DODAG structure, hotspot avoidance, and unnecessary DIO transmissions. Beyond the advantages of composite metric based parent selection, consideration of dynamic parameters may induce frequent parent switching in RPL. To avoid frequent changes in the DODAG structure, the LoB-RPL optimally decides the parent switching threshold. Thus, the proposed work ensures a load-balanced and an energy-efficient RPL routing as well as data aggregation in the IoT environment. The LoB-RPL delivers outperforming results compared to the base RPL under various inter-packet interval time over 50 node topologies.

Keywords: Data aggregation, RPL, IoT, Hotspot problem, Load balancing, Energy efficient DODAG structure, Trickle algorithm, Hysteresis function.

1. Introduction

With the tremendous growth of the Internet of Things (IoT) applications, balanced utilization of resources among sensor devices becomes a crucial factor [1]. Data aggregation is a vital operation for improving the efficiency of IoT communication and network lifetime. Routing Protocol for Low Power and Lossy Networks (RPL) is a widely adopted protocol for IoT networks [2]. The functionalities of the network layer harm the aggregation efficiency. The RPL processes at the network layer may induce uneven energy dissipation among sensor nodes. The RPL constructs the Destination Oriented Directed Acyclic Graph (DODAG) to connect the sensors and root node with the support of different Objective Functions (OFs), and trickle algorithm [3-6]. As per RPL, heavy load is applied on the sensor nodes nearer to the root node than other, to route the datapackets to the root node. It induces the hot spot problem. Thus, improving the efficiency of RPL in the network layer is essential to utilize the advantages of data aggregation techniques in the application layer completely.

The RPL includes a built-in energy-saving mechanism in the DODAG construction process, such as the Trickle algorithm [7], which aims to minimize the number of route updates and message broadcast in the network while maintaining the DODAG structure. However, the Trickle algorithm mainly faces the issue of load imbalancing. The load