Controlled synthesis of Ag/CuO nanocomposites: evaluation of their antimycobacterial, antioxidant, and anticancer activities

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Abstract

Herein we summarize the production of silver/copper oxide nanocomposites (Ag/CuO NCs) by a facile solution combustion method with the aid of abio-fuel as reductant. Powder XRD results revealed the formation of Ag/CuO NCs with average crystallite size ranging from 20 to 25 nm. These NCs were tested for their antimycobacterial activity against four mycobacterium species namely *Mycobacterium tuberculosis H37Rv ATCC 27294, Mycobacterium abscessus ATCC 19977, Mycobacterium fortuitum ATCC 6841, Mycobacterium chelonae ATCC* and anticarcinogenic activity on breast cancer cell line MDA-MB-231. Scavenging activity was evaluated by the 2, 2-diphenyl-1-picrylhydrazyl hydrate (DPPH) method. Results indicated that the Ag/CuO NCs had higher anticancer and slightly better scavenging activities than the undoped CuO nanoparticles.

1 Introduction

Metal and metal oxides NPs exhibit different physiochemical properties and are different than their native bulk compounds in several apects which includes their surface area, optical, thermal, and electrical properties. Metal oxides play a very important role in many areas of chemistry, physics and materials science. Metal oxide NPs can exhibit unique physical and chemical properties due to their limited size and high density of corner or edge surface sites. As a result, the development of systematic routes for the synthesis of oxide NPs is a current challenge.

Among many metal oxides, copper oxide nanoparticles has gained considerable attention due to their distinctive properties and wide range of applications. CuO is a p-type semiconductor with a narrow band gap of 1.3–2.1 eV [1]. CuO NPs are of great interest due to their potential applications in a wide variety of areas including electronic and

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Photocatalytic Activity Induced by Metal Nanoparticles Synthesized by Sustainable Approaches: A Comprehensive Review

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Nanotechnology is a fast-expanding area with a wide range of applications in science, engineering, health, pharmacy, and other fields. Among many techniques that are employed toward the production of nanoparticles, synthesis using green technologies is the simplest and environment friendly. Nanoparticles produced from plant extracts have become a very popular subject of study in recent decades due to their diverse advantages such as low-cost synthesis, product stability, and ecofriendly protocols. These merits have prompted the development of nanoparticles from a variety of sources, including bacteria, fungi, algae, proteins, enzymes, etc., allowing for large-scale production with minimal contamination. However, nanoparticles obtained from plant extracts and phytochemicals exhibit greater reduction and stabilization and hence have proven the diversity of properties, like catalyst/photocatalyst, magnetic, antibacterial, cytotoxicity, circulating tumor deoxy ribo nucleic acid (CT-DNA) binding, gas sensing, etc. In the current scenario, nanoparticles can also play a critical role in cleaning wastewater and making it viable for a variety of operations. Nano-sized photocatalysts have a great scope toward the removal of large pollutants like organic dyes, heavy metals, and pesticides in an eco-friendly and sustainable manner from industrial effluents. Thus, in this review article, we discuss the synthesis of several metal nanoparticles using diverse plant extracts, as well as their characterization via techniques like UV–vis (ultraviolet–visible), XRD (X-ray diffraction),

REVIEW

Alginate Hydrogel Adsorbents in Adsorption of Inorganic and Organic Pollutants: A Review

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The present review discusses various alginate hydrogel adsorbents with unique adsorption performance in environmental remediation. Novel alginate composites were developed with, high swelling capacity and capable of adsorbing toxic inorganic and organic pollutants. Alginate hydrogel adsorbents were developed with a single network and double network structure with excellent adsorption ability in removal of toxic inorganic and/or organic pollutants. Alginate with single or double network composite hydrogels were developed when alginate was combined with graphene/chitosan/polymer to get superior adsorbents in removal of toxic pollutants. Acrylic acid/alginate hydrogel in recent studies are efficient in the elimination of inorganic and organic contaminants. This review will generate interest to researchers to develop novel alginate composite hydrogels with unique properties in the adsorption of toxic inorganic, organic contaminants. This work provides a worthy challenge and the future possibility of designing novel alginate materials for various applications.

Keywords: Alginate hydrogel, Dye, Heavy metals, Adsorption, Adsorption capacity.

INTRODUCTION

The present worldwide concern on the toxicity of water pollutants such as, toxic inorganic elements, organic dyes, pharmaceutical and other industrial organic wastes is a great challenge in developing countries [1-7]. The agricultural and industrial discharges with toxic inorganic and organic pollutants are non-biodegradable water contaminants that lead to serious health hazards in human beings through the food chain [8-11]. Some organic and inorganic pollutants were encountered as worst contaminants in water bodies with persistent nature that adversely affect the aquatic environment [12]. Hence there is more interest to explore an efficient methodology for pollutant removal from contaminated water. A few remediation techniques were utilized for the evacuation of harmful toxins, for example photocatalytic degradation [13], chemical precipitation [14], reverse osmosis [15], adsorption [16-18], *etc.*,

Some skill methods used in treatment are costly, difficult for operation and time consuming, however an advantageous simple and high efficient treatment method in the removal of pollutants is adsorption. In literature, preparation of alginate hydrogel was used as efficient adsorbents with good adsorption performance in removal of dyes, heavy metals, pharmaceutical, other organic wastes. Also some alginate hydrogel composites prove to be promising materials in removal of toxic organic and inorganic contaminants and this has created interest to various researchers and scientists to develop novel alginate hydrogel adsorbents with unique properties and superior adsorption performance in treating contaminated water.

Alginate hydrogel adsorbents: Sodium alginate is a nontoxic and inexpensive natural polysaccharide [19-21] having hydroxyl and carboxyl groups that can be effectively crosslinked with Ca^{2+}, Fe^{3+}, Y^{3+} ions. Alginate is usually modified using varying physico-chemical process to increase its

Room Temperature Columnar Liquid Crystalline Perylene Bisimide as a Novel Corrosion Resistant Surface Film for Mild Steel Surface

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Abstract

The corrosion process can be seen as a widespread phenomenon, which is both pervasive and unstoppable. This is an undesirable phenomenon that reduces the life of materials and takes away their beauty. Potentiodynamic and electrochemical impedance tests are used to explore the corrosion inhibition abilities of a room temperature columnar liquid crystalline perylene bisimide (PBIO10) on mild steel (MS) samples in 1 M HCl. The inhibitor PBIO10 was demonstrated to be an outstanding corrosion inhibitor, with a maximum inhibition efficiency of 76%. In light of potentiometric polarization results, corrosion inhibition was achieved as the inhibitor getting adsorbed on the metal, and they fit into the category of anodic inhibitors. The protective layer was examined from SEM to confirm the protective coating generated on the MS surface. The increase in contact angle confirms the formation of a uniform layer on the MS surface. Analysis of the optical textures observed in POM, the nature of the mesophase under examination to columnar rectangular (Colr) phase. From the TGA, it was found that PBIO10 exhibits higher thermal stability u to 370 ℃. The density functional theory (DFT) and Monte Carlo simulation approach were used to investigate the relationship between molecular structure and inhibitory efficacy. The thermal behavior of PBIO10 was investigated by polarizing optical microscopy (POM), differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), and X-ray diffraction (XRD) studies. The phase transition from crystal to LC phase was at first examined with the help of POM observation.

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Sustainable Paver Block using Waste Plastic and Construction Demolition Waste

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Abstract – This study is aimed at utilizing plastic and construction demolition waste in production of convention concrete paver blocks. In India on an average 26,000 Tonnes of Plastic waste is generated per day, majority of this remains uncollected. According to the statistics, only 5% of the Construction & Demolition waste are processed. In this study an attempt has been made to use plastic waste and construction demolition waste in producing paver blocks and their behavior in compression is studied. The density test and the water absorption tests also have been performed on these paver blocks to study their suitability for the practical usage of the blocks. The study indicates that utilization of plastic waste results in reduced compressive strength and water absorption but it showed an increase in the density.

Index Terms – Paver Blocks, Construction Demolition Waste, Plastic Waste.

I. INTRODUCTION

Conventional paver block production uses cement as a binder material natural resources such as crushed stone as fine aggregates coarse aggregates which are depleting fast. In order to avoid the use of cement and natural resources we have studied using the plastic which is constantly generated as a binder and Inorganic municipal waste such as construction demolition waste and waste glass powder as fine aggregates and coarse aggregates. This will help in reducing the impacts of waste disposal on environment and wastage of land for Landfill.

Fig. 1 Plastic deposited in land and water

Evaluation of Mechanical Behavior of Concrete with Recycled Aggregate and Silica Fume

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Abstract – The increasing gap between the demand and supply of ingredients that are used in production of concrete is driving researchers to identify newer and more sustainable sources in the construction industry. Recycling of concrete is gaining popularity in terms of protecting natural resources and also providing sustainable construction solution. Several investigations have been carried out in order to study and evaluate the effects of using recycled aggregate on the behavior of hardened concrete. In the current study, cubical and cylindrical specimen have been cast and tested for compressive strength and split tensile strength for concrete of grade M25 that was made of recycled aggregates, manufactured sand and silica fume.

Index Terms – Recycled concrete aggregate, Artificial sand, Manufactured Sand, M-sand, Silica Fume.

I. INTRODUCTION

Concrete is a material that is extensively used throughout the world, the consumption of concrete by the construction industry is increasing day by day. This increase in consumption of this product has led to increase in the demand of the ingredients that the concrete is made up of. This results in enormous exploitation of these natural materials. While some of these materials are getting exhausted worldwide, some of these are even banned in few countries and states. Every year thousands of building are demolished in the construction industry and this generates tons of demolition waste. This creates a large disposal problem in this sector. Researches are continuously working in an effort to minimize this disposal by trying to find its utilization in various civil engineering products. Using recycled aggregate results environmentally sustainable concrete, however results have shown that using recycled aggregates in conventional concrete have resulted in reduced strength as the recycled aggregates are more porous due to the coating of mortar over the surface of the aggregate, which increases the water absorption and permeability of the concrete resulting in reduced strength, in this current research, attempts have been made to add silica fume is percentage of 0, 5 and 10 as replacement for cement. Silica fume particles have very fine particles with particle size as 100 times smaller than that of ordinary Portland cement, this helps in reducing the porosity of concrete resulting in increased strength of the hardened concrete. M25 Grade is attempted here with admixture silica fume.

STUDY ON SMART IRRIGATION SYSTEM IN CHIKKABALLAPUR TALUK, KARNATAKA, INDIA

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Abstract : Irrigation is the controlled application of water for agricultural purposes through manmade systems to supply water requirements that are not satisfied by the rainfall. Crop irrigation is vital throughout the world in order to provide the world's ever-growing populations with enough food. Many different irrigation methods from traditional to smart ones are used over worldwide, including: surface, sub-surface, sprinkler, drip, and advanced or smart to satisfy the plants thrust. In this paper efforts have been made to present the basics of different irrigation systems adapted by the Indian farmers to grow their crops.

Water management is the most important issue on which the growth of agriculture sector largely depends. Indian agriculture sector is in dire need of investment to meet the expenses. To fuel the capital needs of the agricultural economy and also to ensure that the benefits of growth percolate to bottom of the socio-economic pyramid, farming has to be projected as an avenue of investment for the urban population. The improvement in irrigation system using wireless network is a solution to achieve water conservation as well as improvement in irrigation practices. This irrigation system allows farmers to reduce runoff from over watering saturated soils, avoid irrigating at the wrong time of day and in effect improve the crop yield by ensuring adequate water supply when needed. Smart irrigation aims to minimize their environmental footprint through efficient water use, and must also run a profitable business. This allows them to reinvest in new and improved technologies which ensure sustainable and responsible irrigation over time.

IndexTerms – Smart irrigation, Groundwater, Chikkaballapur

I. INTRODUCTION

In India, where 60-70% economy depends on agriculture, there is a great need to modernize the conventional agricultural practices for the better productivity. Due to unplanned use of water the ground water level is decreasing day by day, lack of rains and scarcity of land water also results in decrement in volume of water on earth. Nowadays, water shortage is becoming one of the biggest problems in the world. We need water in each and every field. In our day-to-day life also, water is essential. Agriculture is one of fields where water is required in tremendous quantity. Wastage of water is the major problem in agriculture. Every time excess of water is given to the fields. There are many techniques to save or to control wastage of water in agriculture. The objective of the system is to:

a) conserve energy & water resources
b) handles the system manually and automatically
c) detects the level of water.

Due to the climatic changes and lack of precision, agriculture have resulted in poor yield as compared to population growth. Irrigation is mostly done using canal systems in which water is pumped into fields after regular interval of time without any feedback of water level in field. This type of irrigation affects crop health and produces a poor yield because some crops are too sensitive to water content in soil.

India has many rivers whose total catchment area is estimated to be 252.8 million ha (mha) Out of about 1869 km^3 of surface water resources, about 690 km^3 of water is available for different uses. The ultimate irrigation potential of the country has been estimated to be 139.5 mha. India has acquired an irrigation potential of about 84.9 mha against the ultimate irrigation potential. About 360 km^3 of groundwater is also available for irrigation. Water is the most critical input for enhancing agricultural productivity, and therefore expansion of irrigation has been a key strategy in the development of agriculture in the country If we analyse agricultural growth during the past four decades, we find that high-yielding varieties, irrigated area expansion and fertilizer use have been the major factors contributing to the achievement of green revolution in India. There has been a steady increase in the irrigation potential from groundwater. The contribution of groundwater to total food grain production of the country is significant, as more than 50 per cent of the irrigated area is using groundwater and in several

Proposals and Remedial Measures to Decongest Yelahanka Police Station Junction

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Abstract: *Rapid population growth in recent years ,mainly because of IT and other associated industries in and around Bengaluru led to an increase in the vehicular population to about 1.5 million, with an annual growth rate of 7-10%,. There has been a phenomenal growth in the population of vehicles as well especially the two and four wheelers in this period due to rising household incomes. Two wheelers constitute more than 70% of the total volume, while cars comprise 15%, autos 4% and the remaining 8% includes other vehicles such as buses, vans and tempos. The number of motor vehicles registered has already crossed 49 Lakhs. In the absence of adequate public transport system, people are using the personalized modes which is not only leading to congestion on limited road network but also increasing environmental pollution.Yelahanka police station Junction which connects International air port road with the city is one of the busiest intersections in Bengaluru. This paper examines the traffic problems and sustainable improvement of road intersection at above junction. The causes of traffic congestion were studied and suggested different remedial measures to reduce number of accident and make traffic flow smooth. The three phased signalized intersections at Yelahanka junction was considered as the primary study area. At the intersection present signal timing, classified volume count, stopped delay, queue length and optimum cycle length were measured and analysed. Analysis of the collected data revealed that the improper planning of the junctions, lack of traffic signals and unauthorized parking are the major factors contributing to the traffic congestions. Various remedial measures are also proposed, focusing on junction improvement, alternative operation plan and junction signalization.*

Keywords**:**
Signalised intersection, traffic signal design, stopped Delay, grade separated intersection

I. INTRODUCTION

The world is facing traffic congestion which is a global issue. The growth of vehicles has increased due to urbanization and industrialization. Bangalore is a rapidly growing city. The city core is an old city leading to International Airport Road surrounded by planned development which is currently sprawling within the natural limits. The North part of the city forms the heavy population of the city and is accessed through all direction, which today is amongst busiest street junctions. The streets connecting the junction serve as the major commercial streets, especially towards the eastern side and airport on its northern sides. These junctions and streets were functional without hassle when the city had a very few numbers of motor vehicles.Traffic signal at this junction was designed in 2003 and at that time there were very less number of vehicles but now days due to infrastructure development ,due to more vehicles, congestion is taking place. Increase in traffic volume has caused problems in traffic operations like accidents, delay, congestion, fuel consumption, pollution.

1.1 Physical characteristics of the area

1.1.1 Population growth

As of 2011 India census—Yelahanka had a population of 3,00,000. Males constituted 54% of the population and females 46%. The literacy rate was 75%, higher than the national average of 59.5%: male literacy was 80%, and female literacy was 68%. Eleven percent of the population were under 6 years of age.

1.1.2 Growth of motor vehicles

Number of motor vehicles registered in the past has increased which a direct effect in the congestion has caused at Yelahanka junction. The number of people using public transport has

HYDROCHEMICAL ANALYSIS OF GROUNDWATER QUALITY IN DAKSHINA PINAKINI RIVER BASIN, KARNATAKA, INDIA

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Abstract: Dakshina Pinakini river basin is a sub basin of River Kaveri, located in the north eastern corner of Karnataka state. The study area is spreads over an area of 2185 sq. km falling within the semi-arid region and frequently facing water scarcity as well as quality problems. To analyses the water quality parameters, 184 samples are collected from different locations during pre-monsoon and post-monsoon period. The type of water that predominates in the study area is Ca-Mg-HCO_3 type both in pre- and post-monsoon seasons based on hydro-chemical facies. Besides, suitability of water for domestic and irrigation purposes are evaluated based on sodium adsorption ratio, residual sodium carbonate, sodium percent, salinity hazard and USSL diagram.

Keywords: Groundwater, chemical characters, chemical classification, SAR, RSC.

Introduction

Water quality analysis is one of the most important aspects in groundwater studies. The hydro chemical study reveals quality of water that is suitable for drinking, agriculture and industrial purposes. Further, it is possible to understand the change in quality due to chemistry of rock water interaction or any type of anthropogenic influence (Kelley 1940.Wilcox 1962) Groundwater often consists of seven major chemical elements- Ca^{+2}, Mg^{+2}, Cl^{-1}, HCO_3^{-1} Na^{+1}, K^{+1}, and SO_4^{-2}. The chemical parameters of groundwater play a significant role in classifying and assessment of water quality. Considering the individual and/or paired ionic concentration, certain indices are proposed to find out the alkali hazards. Residual Sodium Carbonate (RSC) can be used as a criterion for finding the suitability of irrigation waters. It was observed that the criteria used in the classification of waters for a particular purpose considering the individual concentration may not find its suitability for other purposes and better results can be obtained only by considering the combined chemistry of all the ions rather than individual or paired ionic characters (Handa 1964, 1965; Hem 1985). Chemical classification also throws light on the concentration of various predominant cations, anions and their interrelationships. A number of techniques and methods have been developed to interpret the chemical data. Zaporozee (1972) has summarized the various modes of data representation and has discussed their possible uses. Presentation of chemical analysis in graphical form makes understanding of complex groundwater system simpler and quicker. Subramanian (1994) followed a series of methods to interpret and classify the chemistry of groundwater in hard rock, including coastal zones in the southern parts of India. The objective of the present work is to discuss the major ion chemistry of groundwater of study basin. In the present study various methods proposed by Piper, Back, Wilcox, Eaton, Todd and USSL (US Salinity Laboratory) classification have been used to study critically the hydro chemical characteristics of groundwater of the basin.

Research Article

A comparative study on energy efficient clustering based on metaheuristic algorithms for WSN

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Abstract
One of the important technologies in wireless sensor networks (WSN) is an efficient and dependable routing system. In WSN, energy is the key resource for extending network lifespan. Nowadays, WSN is utilized for a variety of applications, and there is always an issue with energy consumption. As a result, to find out the best energy efficiency model is the primary focus of this research in order to extend the life of the network. Different energy-efficient clustering (EEC) methods based on artificial bee colony optimization (ABC) are applied for the WSN in this comparative research to increase the network's energy efficiency. To increase energy efficiency during the communication process, the enhanced memetic artificial bee colony (EMABC), global artificial bee colony algorithm based on the cross over and tabu search (CGTABC), Energy-efficient clustering using artificial bee colony (EC-ABC), memetic artificial bee colony algorithm (MeABC), and randomized memetic artificial bee colony algorithm (RMABC) are implemented. The EEC method involves forming the appropriate quantity of clusters and selecting cluster heads in a dynamic manner. Furthermore, relay nodes are chosen with energy efficiency objectives, and they are computed afterwards. The implemented methods perform EEC. In terms of assessment and validation, the implemented models are compared. As a consequence, the proposed EMABC model performed well in terms of energy efficiency, with an efficiency of 82.44%, an end-to-end delay of 99.68ms, a packet drop rate of 152, a throughput of 680.28Kbps, packet delivery ratio of 98.05%, and network lifetime of 91%.

Keywords
WSN, Energy efficiency, Network lifetime, Clustering, Routing, Enhanced memetic artificial bee colony.

1.Introduction
A wireless sensor network is a network that connects sensor units wirelessly to observe and monitor environmental factors [1]. Wireless sensor networks (WSNs) are a subset of ad-hoc networks. The energy limitation on WSN nodes is critical, and it is thoroughly analyzed to make WSN robust, reliable, and useful in real-world cases. Sensor nodes operate on a limited quantity of energy supplied by a small direct current (DC) source within the sensor node unit, which cannot be changed once the network is deployed.

In addition to energy, other important restrictions of WSN include limited sensing range, transmission range, sensor node processing capabilities, and sensor node memory capacity [2]. A sensor node's sensing range describes the location around the sensor that it can observe or monitor. In contrast, the transmitting range defines the location around the sensor till the sensor node may communicate data gathered by it. Because detecting and transmitting are the two most costly activities of a sensor node, these two restrictions are critical. The design of the network has a serious effect on the scalability and performance of the WSN. The architecture of WSN can be designed on two types: flat and two-tier or hierarchical [1].

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High voltage power supply controller for Electrostatic precipitators

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Article Info

ABSTRACT

Gaseous exhausts from various industries pollute the environment with fly-ash generally filtered by electrostatic precipitators (ESPs) before being released to the atmosphere. This paper presents the development of a controller for ESP power supply. The controller maintains the voltage applied to ESP at its maximum average value by duty cycle control that results in an improvement in dust collection-efficiency. The limiting factor for the output voltage is the breakdown of gas (spark/arc) in the electrode gap of ESP. During a spark/arc condition, the duty cycle limit imposed by the controller causes a reduction in output voltage that leads to the prevention of spark/arc. The present design has a response faster than line frequency power supply controllers. The control circuit is simpler, easy to implement and uses a standard PWM controller IC. The design of power stage uses a flyback current-fed push-pull DC-DC converter with multiple secondary circuits, which has the advantages of instantaneous current limit and less voltage stress on rectifier-diodes. Simulation is performed to obtain a 1 kV, 100 W output from a 24VDC source. The results are compared with experimental values to validate the controller's ability to achieve good load regulation during normal operation and a reduction in output voltage during spark/arc condition.

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1. INTRODUCTION

The major source of environmental pollution is fly-ash (dust) particles from various industries and power plants. Government regulatory bodies have made extraction of fly-ash particles from industrial flue gases mandatory before they are released into the atmosphere. Electrostatic precipitators are used to filter fly-ash particles by ionizing them in a high electric field. A typical electrostatic precipitator (ESP) consists of a discharge electrode that is negatively charged and the other, a grounded collecting electrode. A high voltage is applied between these electrodes to initiate a corona discharge to ionize the dust particles. The charged dust particles get deposited on the collecting electrodes. They are periodically dislodged by rapping the electrodes and are collected in dust hoppers to be removed. ESP power supplies in the range of 10-100 kV are used in incinerators, biomass plants, power plants and process industries to name a few. In many small-scale ESPs use high voltage power supplies of few hundred watts also [1].

ESP power supplies used in large industries are thyristor-controlled, operating at line frequency. They are plagued with low average DC output due to line frequency operation, high percentage ripple, large

Distributed Generation System Reliability Evaluation Using Fuzzy Logic with Renewable Energy Sources

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Abstract— The essential challenges in the Distribution System (DS) are reliability and continuity. The electric load architecture of the distribution network altered as a result of social and political changes. The DS becomes less reliable as a result of a lack of maintenance and the aging of the distributing firm's assets. It was difficult for technicians to recognize and categorize assets concerning operational and maintenance requirements. As diverse resources and innovations are being used, distribution generation (DG) is predicted to perform a major role in the successful progression of power systems. DG is most commonly connected with two forms of energy: traditional and renewable. It is extremely difficult to predict when renewable energy will be more unreliable. Fuzzy logic could be employed to estimate DS reliability indices. In this paper, fuzzy logic is used to analyse the DS's reliability indices. The fuzzy toolbox is used to create the IF-THEN rule, which employs inferences depending on past knowledge. Analytical and Monte Carlo Simulation (MCS) methods are used to compare the results of the fuzzy logic method.

Keywords— Electric Vehicle, Motor, Speed, Optimization, Error, Time response.

I. INTRODUCTION

The concepts are of reliability and applicable to practically all application areas. Through its widest sense, reliability is a measure of system performance. This metric could be utilized to enable systems to fulfil performance requirements, quantify differences among alternative approaches, and generate economic judgments. The main purpose of reliability assessment is to deal with queries like "Is the network adequately reliable?", "What plan is most prone to failure?" and "where will another money be invested to better the network?" [1]. The objective of a power grid will provide energy to its clients cost-effectively and reliably. It is important to formulate and manage a reliable network since interruptions and electrical problems could have a major impact on the economy and the clients. Presently, deregulated power utilities would be reformed and run as distinct generating, transmitting, and distributing corporations, with accountability for the reliability and quality of the power system.

DG are small-scale (10 MW or fewer) power sources located at the consumer terminal that can produce electricity independently for a few consumers while also connecting to public distribution [2]. DGs include wind turbines, fuel cells, PV cells, internal combustion motors, and renewable sources. DG offers different benefits for power DS support, including decreased energy consumption, investment preservation, utilization of new energy, and enhanced dependability and flexibility. It is utilized frequently in the distribution network. As technology progresses, the use of DG in power distribution networks becomes more prevalent. Concerns of interconnection, protection coordination, and voltage regulation must be addressed when integrating DG into the energy system. However, the main benefits of integrating DG into a power supply are greater reliability and cost reductions.

DG technologies have a significant effect on high-reliability claims, such as providing a capacity source during an emergency or delaying the construction of a local network. During power disruptions, DG can be

Review Article

Comprehensive Review on State of Charge Estimation in Battery Management System

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Abstract - This paper describes the latest methods and enhanced techniques used to determine the precise State of Charge (SOC). The three primary factors influencing SOC accuracy are the environmental temperature, current, and open-circuit voltage for a typical battery. It is essential to know the SOC that judges the battery's life. This paper analyzes five different methods to estimate the SOC using different Algorithms and Neural networks. These methods are state-of-the-art methods that can be used to check the correctness of the measurement of SOC in batteries. This paper discusses and analyses the Regression algorithm, time series algorithm, K nearest neighbor algorithm, AGA-based RBF neural network, and Back Propagation neural network to determine the précised SOC. Each method's advantages and disadvantages were discussed and compared with other models to show their superiority. A sample of data was fed to these models, and the result was noted for all five methods. Later, the data were analyzed for their accuracy.

Keywords - AGA-based RBF neural network, Backpropagation neural network, K nearest neighbor algorithm, Regression algorithm, State of charge, Time series algorithm.

1. Introduction

The government recommends using electric vehicles to avoid environmental pollution and the fossil fuel crisis[1]. These environmentally friendly vehicles do not depend on fossil fuels[2]. These vehicles use batteries to function. Off-late, many companies are investing in manufacturing electric vehicles. These include two-wheelers and Four-Wheeler. Few companies have already manufactured and sold these vehicles to users. However, they fine-tun the batteries for their long-lasting mileage[3]. The main component of electric vehicles is batteries. In the overcharged battery of an electric vehicle, the electrolyte inside the battery gets heated, and the battery's temperature increases for a long time which may cause a fire. If an over-voltage/over-current occurs during cell balancing, a power surge could be inside the battery, leading to a breakdown. So, it is important to take care of the batteries from over-charging, under-charging, over current, under-voltage, short circuit, and temperature variations so that it gives long life to the batteries[4]. The Battery Management System (BMS) helps monitor the battery packs, charge status, and health status and helps optimize the battery. Cell balancing technology will improve the battery's life for a long time. The Battery Management System (BMS) helps monitor the battery packs, charge status, and health status and helps optimize the battery. Monitoring voltage, temperature parameters, and coolant flow are achieved thru BMS. The components of BMS are as shown in Fig. 1.
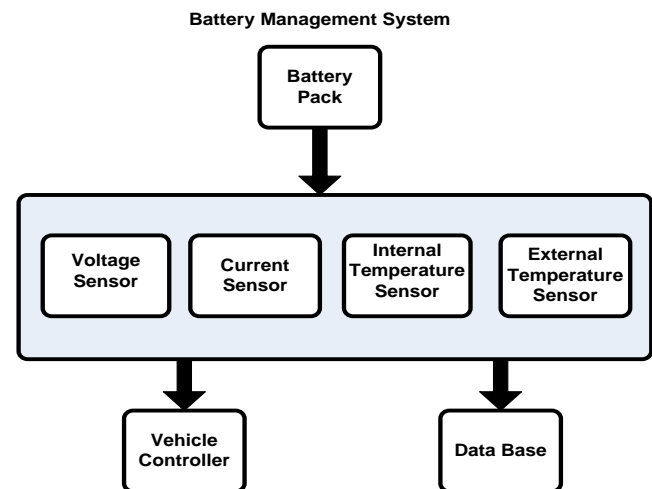

Fig. 1 Components of BMS

1.1. Components of BMS
1.1.1. Obtain temperature data from the battery
- To measure a precise temperature inside the battery is challenging. If the accurate temperature of the battery is not measured, the battery life is decreased. Hence, sensors are used to measure the temperature[5].

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Machine learning tool for exploring sentiment analysis on twitter data

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Abstract

In social media, micro-blogging is a common routine of most people around the world. Social media analytics gathering structure and unstructured Big-Data from various social sites and analyzing to make business decisions using Apache Hadoop and Apache Hive respectively. The objective of the research work was to develop big data technology used for gathering and handling large unstructured data from real time social media for sentiment analysis for identifying the brand and services. The methodology devised an algorithm based on sentimental analysis using customers review classification, which dealt with prepossessing the datasets, clustering of the data based on the specific domains, feature vector using n-gram models and tf-idf vectors extracts synonyms and classification sentiment analysis. The result shows that applied sentimental analysis with unsupervised clustering of data into specific domains and supervised machine learning techniques handle large amounts of twitter data in an efficient way. The developed tool 1.5 times faster than that of traditional database to Hadoop cluster and also the accuracy is nearly 80 %, which helps the user in computing, analyzing and interpreting interaction and associations between people, topics and ideas.

Introduction

Most of the civilians are voluntarily involved in many social networking platforms such as Instagram, Twitter, facebook, etc. to express their emotions, opinions, feelings or beliefs on both places or personalities [1]. This sentiment analysis provides visitors and consumers in all the field rich information, which can reduce ambiguity regarding visiting or purchasing which leads to higher sales of the product [2]. The review data obtained from social media are large and unstructured, therefore analyzing individual reviews could be tedious work. Many analysis techniques have been proposed to resolve issues of analyzing social media data [3], [4], [5]. Discuss advantages of using sentiment analysis in identifying the customer sentiment towards any product or service [6]. The research work identifies sentiment analysis as a better approach for converging large textual data into sentiment scores, which companies can make use for identifying their customer perception. Though sentiment analysis is considered as a better approach of analysis of consumer sentiment, various methods have been adopted in designing the sentiment analysis algorithm. Xieling and Haoram [7] describes a method for computing sentiment analysis using an unigram model as a base of analysis and determining mean and standard deviation of the overall sentiment expressed in the text [8]. Oracal proposes a platform to determine sentiment analysis using the method of categorization and enrichment. The platform helps in classifying the related text into a particular group and identifying the sentiment of the classified group [9].

Many techniques such as machine learning [10], lexicon based method[11], statistical method [12], knowledge based [13] and hybrid approach are used for sentiment analysis for various applications. The sentiment analysis could be classified into sentiment polarity like positive or negative, which can be estimated using Bag-of-word (BoW), part-of-speech (PoS) and semantic relation. Schukla [14] developed a tool for judging the quality of the research paper based on text and annotations [1].

Section snippets

MUSIC INFORMATION RETRIEVAL USING SIMILARITY BASED RELEVANCE RANKING TECHNIQUES

KARTHIK VASU*AND SAVITA CHOUDHARY†

Abstract. The purpose of this proposed study activity is to construct a system for the job of automatically assessing the relevance of music datasets, which will be used in future work. Determine item similarity is an important job in a recommender system since it determines if two items are similar. Participants' systems must provide a list of suggested music that may be added to a given playlist based on a set of playlist characteristics, which will work along with the algorithms designed to provide other similar songs. Specifically, in this study, the challenges of detecting music similarity only on the basis of song information and tags given by users have been addressed. The proposed technique has been tested using a variety of machine learning algorithms to see how well it performs. tf-idf and Word2Vec are the methods used to model the dataset and generate feature vectors. It has also been found we that machine learning techniques, including Collaborative Filtering, KNN, Frequent Pattern Growth, and Matrix Factorization, have a greater influence on relevance ranking than traditional methods.

Key words: Music Information Retrieval, Machine Learning, Collaborative Filtering, Spotify

AMS subject classifications. 68P20, 68T05

1. Introduction and examples. It is the search and organization of enormous collection of music, or musical information, as per their relevance to particular queries that is the subject of Music Information Retrieval (MIR). This is especially significant in light of the large amounts of musical information that is now accessible in digital format, as well as the widespread use of music-related digital services. Aside from that, given its apparent commercial appeal, the majority of media content owners as well as distributors (e.g., Philips and Sony), as well as major technology companies (e.g., Apple and IBM), are actively engaged in research in the area, and a growing number of libraries are attempting to integrate some form of support for MIR into their on-line digital services. This results in an analysis of the text against the text data connected with album and& songs, making the system practically identical to any text-based search engine in terms of functionality (e.g. Google, Yahoo). Although this is the case, systems that are capable of receiving "musical" enquiries, like musical scores, whistling melodies (query by humming), or audio recording segments are necessary due to the nature of the content being retrieved.

The phrase "song similarity" refers to the measurement of how close two songs are close in terms of how probable it is that user really want listening to them when they are compared side by side. Yes, the process of developing an objective similarity measure is subjective, and researchers have taken two approaches to accomplish this: Both the objective technique, in which likeness is identified related to the raw data, such as spectral or rhythmic analysis of songs, and the subjective approach, wherein user-generated data, such as tags (also known as collaborative filtering), are used, are discussed further. For the sake of this research, we shall use the subjective technique to determine the extent to which two tracks are comparable to one another. We would then create a resemblance level among two songs scale from 0 (totally distinct) to one (identical), and then we will determine it using the co-occurrences of pairs of things in users' histories by using cosine metric to determine how similar two songs are to one another. For more information, please see the following link. This measure will also serve as our model of reality and, as a result, as our source of truth in the future. Such a concept is realistic, as shown by the fact that researchers in the area have utilized it successfully [1].

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Original Article

Interactions of amyloid precursor protein intracellular domain (AICD) with copper and DNA fragment reveal conformational changes that trigger AD

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ABSTRACT

Neurofibrillary tangles and Amyloid plaques are central to the progression of Alzheimer's disease [AD]. It has been well substantiated that the Amyloid precursor protein is cleaved enzymatically at its C terminal end yielding the APP intracellular domain [AICD]. It has been shown that AICD is an intrinsically unstructured molecule involved in AD pathology and appears to be a potential candidate in understanding the complexity of this disease. However, the relevance of AICD mechanism in neurodegeneration is poorly understood. Recent evidences reveal that AICD is localized in the nucleus, and upon binding to DNA, gene expression appears to get altered, and this could be regarded as the third hallmark of AD. Reports have highlighted that higher concentrations of copper induces a neurotoxic effect, which could enhance the AD pathogenesis. Hence, our work using circular dichroism and computational studies focuses on the interactions of AICD with copper and DNA which indicates that AICD-Cu complex interacts with the DNA and triggers conformational perturbations leading to AD.

KEYWORDS: Alzheimer's disease (AD), copper, AICD, circular dichroism, docking studies, DNA.

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INTRODUCTION

Alzheimer's disease (AD) is considered as a neurodegenerative disorder primarily characterized by progressive impairment of memory, decreased cognitive function, paranoia and decline in language function. According to the World Alzheimer's Report (2019) over 50 million people are affected by dementia. This according to the reports is said to reach 152 million by 2050. The current cost of dementia care is estimated at US $1trillion which may double by 2030. The pathogenesis of (AD) is extremely complex and involves the formation of neuropathological lesions, amyloid plaques (Aβ) and neurofibrillary tangles (NFTs) [1]. Recent evidences [2, 3] reveal that the amyloid precursor-protein (APP) is cleaved by gamma-secretase through proteolysis in a controlled manner at the C terminal end. Through this an additional 58 amino acid residue catabolite, the APP intracellular domain (AICD) is formed in the cytosol [4]. This is in-turn cleaved by epselon cleavage and caspase3 into JCASP (**VMLKKKQYTSIHHGVVEVDA**) and C31 (**AVTPEERHLSKMQQNGYENP TYKFFEQMQN**) fragments, and the C31 is believed to be involved in neuronal death [5, 6]. It is also well evidenced that the 656I-667V hydrophobic cluster, the 667-VTPEER- 672 which is the helix capping box at the N terminal end, and the 684-NPXY-687 which is the type I β-turn are known to make up the structure of AICD.

Replacement of Soyabean Meal in Poultry Feed with De-Oiled Silkworm Pupa Cake obtained through Pilot-Scale Supercritical Fluid Extraction Technology

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ABSTRACT

Surge in price of soyabean in the domestic and international market has led to a hunt for potential alternative for protein sources in poultry feed. Silkworm pupa is a rich nutrient reservoir of fats, protein, minerals, essential amino acids etc., which is underutilized for its potential nutritional applications. Despite its rich nutritional value, it is considered as a waste and discarded unscientifically resulting in serious environmental concerns. Therefore, in the present study De-oiled Silkworm Pupa Cake (DOSPC) rich in protein (64.88%), obtained from defatting the discarded silkworm pupa through a pilot scale Supercritical Fluid Extraction technology, was used as a sustainable alternative to soyabean meal in poultry feed. For the present study, 1500 numbers of broiler chicks (day old chicks) of COBB variety were selected and divided into 5 experimental groups and 10 replicates per group with 30 birds per replicate, which were fed in amounts Control Diet comprising 100% Soyabean meal and 0% DOSPC(Group 1), Diet with 25% DOSPC and 75% Soyabean meal (Group 2), Diet with 50% DOSPC and 50% Soyabean meal (Group 3), Diet with 75% DOSPC and 25% Soyabean meal (Group 4) and Diet with 100% DOSPC and 0% Soyabean meal (Group 5). Experimental trials were conducted for 6 weeks and details of average body weight gain, feed consumption and FCR was collected for each week. The results from this study suggested that Soyabean meal can be replaced with DOSPC upto 50% and/or 75% for optimum FCR and Body weight gain in the birds. Both group 3 and 4 reported similar output with no significant variation. Body weight gain of 2610 g/bird was observed in the treatment group 3 compared to the control group which was 2324 g/bird, FCR of 1.36 was observed in Group 3 which was significantly better than the FCR of the control group which was 1.52. The immunological assay against Newcastle Disease (ND) and Infectious Bursal Disease (IBD) revealed improved immune response in treatment groups supplemented with DOSPC in their feed. The organometry, histopathological, gut health and overall growth performance of the treatment group was on par with the control group and this suggested that replacement of Soyabean Meal with 50% and/or 75% is beneficial for poultry farming in terms of better nutritional intake for the birds and profitability for the poultry farmers.

Keywords: *De-oiled silkworm pupa cake, Supercritical fluid extraction, Poultry, Broiler, Feed, FCR, Growth, Omega 3 Fatty Acid, ELISA, Immunological Assay and Carcass traits etc.,*

1. INTRODUCTION

Poultry industry is highly sensitive to price fluctuations of the feed ingredients. Feed contributes to 60%-70% of the cost in poultry rearing (TNAU Agri portal Animal Husbandry, 2015), wherein maize comprises 55-60% of the feed and soyabean meal comprises 30-35% approximately. In India, poultry meat contributes to 37% of the total animal protein consumption (Ahmed and Islam, 1990), but the poultry industry has been facing setbacks due to the prices and availability of key ingredients of the feed. Soyabean meal contributes to 30% of the poultry feed composition. COVID19 related logjams have resulted in a sudden jump in the prices of soyabean meal. The prices of soyabean meal was INR 30/kg in March, 2020 which plunged to a record high of INR 92.5/kg in July, 2021. This has gravely impacted the poultry sector.

CHARACTERIZATION AND ANTIMICROBIAL ACTIVITY STUDIES OF CALCITE-ZINCATE NANOPARTICLES BY GREEN SYNTHESIS

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Abstract: Nanoparticles (Nps) are extremely useful in a extensive choice of industries, together with electronics, the environs, cosmetics, material science, and medicinal systems, among others. Calcium Carbonate ($CaCO_3$) and Zinc Oxide (ZnO) nanomaterials have long been popular research topics. It is frequently used in dentistry applications due to its biocompatibility. The purpose of this study was to produce and describe calcium carbonate/zinc oxide nanoparticles ($CaCO_3$/ZnO-NPs) prepared via precipitation method. The precipitation method has many advantages, including being more controllable and reproducible, as well as allowing for easy particle size control. Temperature and the calcination process both have an impact on the formation of nanoparticles. The calcination at high temperatures resulted in spherical-shaped particles, a reduction in aggregate size, and an increase in the crystalline nature of the NPs. Nitrates of calcium and zinc, sodium hydroxide were used, along with silk washed waste water containing sericin as a capping agent. $CaCO_3$/ZnO-NPs were produced at 60°C using calcination (500°C). The antibacterial activities of the nanoparticles against gram-positive bacteria Staphylococcus aureus and Enterococcus faecalis, as well as gram-negative bacteria Escherichia coli and Klebsiella pneumoniae, also, Fungus - Candida albicans were investigated, via the disk diffusion method. $CaCO_3$/ZnO-NPs were successfully produced and exhibited a crystalline nanostructure, confirmed the elements of $CaCO_3$/ZnO-NPs, and revealed that the $CaCO_3$/ZnO-NPs obtained had an irregular spherical shape. The nanoparticles were found to be void of contaminants and organic. The absorption group at nm points out the occurrence of $CaCO_3$, and the absorption group at 380 nm confirm the existence of ZnO. In addition, these $CaCO_3$/ZnO-NPs have improved antimicrobial activity with potential applications in dentistry.
Keywords: precipitation method; green synthesis;characterization; antibacterial;antifungal; disc diffusion method;

I. INTRODUCTION

Nanotechnology is defined as "the meticulous and precise employment, accuracy employment, exhibiting, size, and synthesis of ingredients at the nanoscale to a variety of material, arrangements, and maneuvers by basically unique features and tasks" [1].Humans have long been interested in "nano"-sized existence. Richard P. Feynman, a physicist and well-known Nobel Prize winner was generally credited with developing the idea of nanotechnology [2].

Conversion of palm oil sludge to biodiesel using sulphuric acid as catalyst

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Abstract

The present study focuses on utilizing palm oil sludge (POS) as low-cost feed stock for biodiesel production. The esterification reaction was performed by varying sulphuric acid dosage (2–5% wt), methanol to palm oil sludge molar ratio (3.5:1–9.5:1), reaction time (30–120 min), temperature 60 °C and stirred speed 400 rpm. The free fatty acids (FFA) considerably reduced from 17.76% to 1.34% and maximum esters yield was observed to be 91.56% at optimal conditions, 4 wt % H_2SO_4, methanol to palm oil sludge ratio 7.5:1 and 60 min.

The biodiesel was produced by transesterification process by varying sodium hydroxide catalyst concentration from 0.25 to 1.5 wt%. The maximum biodiesel yield of 92.2% was obtained at 0.25 wt% of NaOH. The biodiesel was tested for the fuel properties as per the IS 1448 protocol and compared with normal diesel fuel with reference to ASTM D6751 standards.

Keywords: Esterification, Free Fatty Acid (FFA), Indian Standards (IS), Methanol, Sludge Palm Oil (SPO), Transesterification.

Introduction

Biodiesel is the mixture of fatty acid methyl esters (FAMEs) or fatty acid ethyl esters (FAEE) produced from vegetable oils like palm oil, canola oil, soybean oil, sunflower oil and waste frying oil[6]. In 2021, world palm oil production was 76.538 million tons as reported by US Department of Agriculture[12] and for every ton of palm oil, approximately equal amount of palm oil sludge is generated. It is considered that the wastage generated by palm oil production mill has great impact on environmental pollution, contributing to 80% of the total palm oil industrial pollution[5].

Muanruksa et al[9] defined that the supernatant layer of wastewater release by palm oil processing plants is classified as palm oil sludge (POS) whose characteristics might vary according to the palm oil production process and raw materials utilized (Figure 1). POS contains high concentrations of organic material, oil and greases and suspended solids, high BOD and COD[2]. The problem with the POS feed stock is its high free fatty acid content making it unsuitable for the biodiesel production. The current study aims at reducing the FFA content using sulphuric acid catalyst through esterification reaction followed by transesterification reaction with a base catalyst for biodiesel production.[13-15]
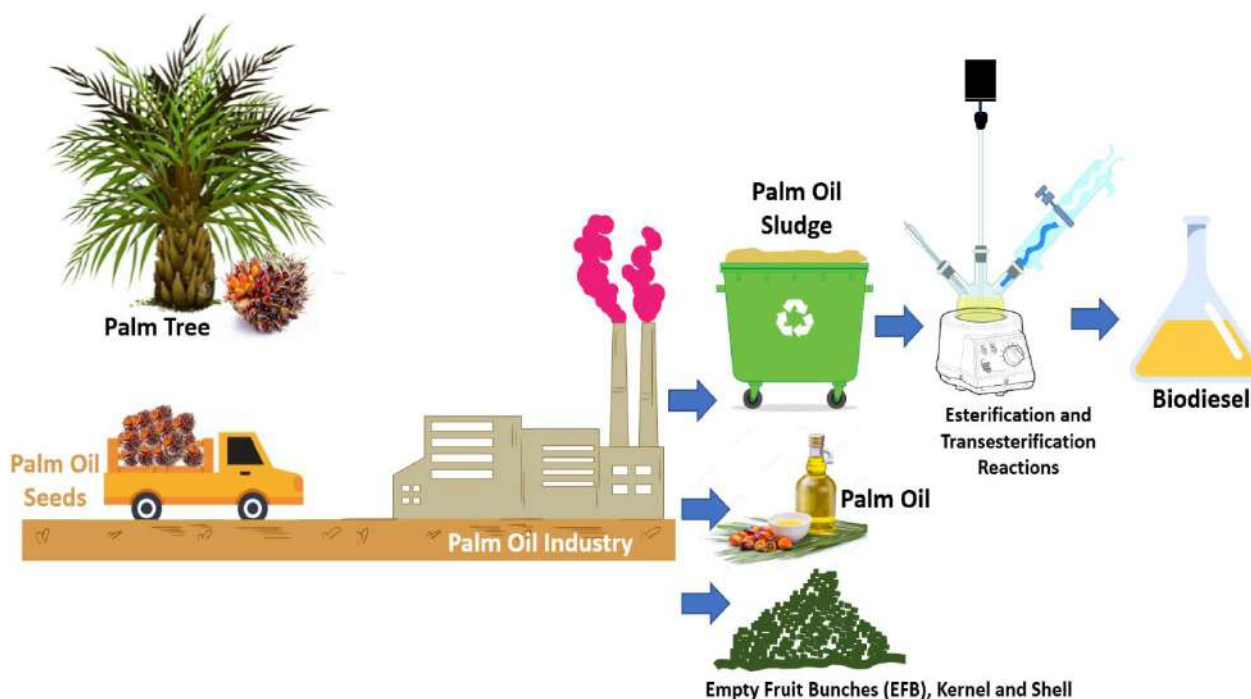

Figure 1: Flow diagram showing utilization of palm oil sludge for the production of biodiesel using esterification and transesterification reactions

Original Article

Antiproliferative, Apoptosis-inducing activity and Molecular docking studies of Sydnones compounds

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ABSTRACT

Objective: To evaluate the antiproliferative and apoptosis inducing activity of different sydnones on cancer cell lines and their interaction with cancer proteins by molecular docking studies.

Material and Methods: Antiproliferative activity was carried out by MTT assay and apoptosis inducing activity was performed by DAPI and Annexin V and propidium iodide staining. Molecular docking studies were performed using AutoDock Tools 1.5.6. Pharmacokinetics properties like ADME and toxicity were analysed by pkCSM web server.

Result: In this study, four new sydnone compounds 3-(4-nonylbiphenyl-4'-yl) sydnone (MC-182), 3-(4-propylbiphenyl-4'-yl) sydnone (MC-454), 3-(4-hexylbiphenyl-4'-yl) sydnone (MC-433), and 3-(4-methylbiphenyl-4'-yl) sydnone (MC-431) were screened for antiproliferative and apoptotic effect against BT-474 (human breast cancer), HeLa (human cervical cancer) and Jurkat (human myeloid leukemia) Mostly, all the sydnone compounds exhibited decent antiproliferative effectiveness, but compound MC-431, MC-433, and MC-454 showed more antiproliferative activity (IC50 1.71, 10.09 and 2.87 µM against BT-474, Hela and Jurkat cell line, respectively). The changes of morphological characteristics of cancer cells determined by staining techniques indicate the apoptotic cell death. The molecular docking and interaction studies were carried out between sydnones with cancer proteins (epidermal growth factor domain receptor tyrosine kinase [EGF-TK], tumor necrosis factor-alpha [TNF-α] and Caspase3. Among all four sydnone molecules, two compounds MC-454 and MC-431 showed good binding energy with targeted proteins. Drug-like property was predicted by ADME toxicity study.

Conclusion: The results indicate sydnone compounds were found to exhibit anticancer activity by inducing apoptosis. The molecular docking study of sydnones with cancer proteins showed a decent interaction affinity. The results of absorption, distribution, metabolism, excretion and toxicity studies by the Insilco approach also proved that MC-454 sydnone showed better In-Vivo administration. Thus, the current research work indicates that these sydnone compounds would be prospective in developing anticancer medicines.

KEY WORDS: Sydnones, apoptosis, cancer proteins, Binding energy, toxicity

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INTRODUCTION

Cancer is known as an important cause of death in humans and according to the WHO more than 70% of all cancer deaths happen in developing countries.[1] Recently, there has been an increase in deaths from different types of cancers globally, with a prediction of 12 million deaths in 2030.[2] In spite of the improvement in the understanding of bioorganic procedures linked with carcinogenic potential, significant challenges are still there for effective treatment of cancer because of the general toxicity of conventional cancer chemotherapeutic agents. Thus, the search for a new medication to treat cancer is still an essential and demanding job for researcher.

Recently, many scientists have shown a path in drug discovery based on the biological properties of liquid crystal pharmaceutical (LCP). The LCP molecule Tolecine was identified for antitumor, antibacterial and antiviral properties.[3] Sydnone derivatives have liquid crystalline properties that flow like liquids but maintain some of the ordered structure of its molecules.[4] Sydnones are novel mesoionic compounds due to their versatile applications in various fields.

REVIEW

Alginate Hydrogel Adsorbents in Adsorption of Inorganic and Organic Pollutants: A Review

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The present review discusses various alginate hydrogel adsorbents with unique adsorption performance in environmental remediation. Novel alginate composites were developed with, high swelling capacity and capable of adsorbing toxic inorganic and organic pollutants. Alginate hydrogel adsorbents were developed with a single network and double network structure with excellent adsorption ability in removal of toxic inorganic and/or organic pollutants. Alginate with single or double network composite hydrogels were developed when alginate was combined with graphene/chitosan/polymer to get superior adsorbents in removal of toxic pollutants. Acrylic acid/alginate hydrogel in recent studies are efficient in the elimination of inorganic and organic contaminants. This review will generate interest to researchers to develop novel alginate composite hydrogels with unique properties in the adsorption of toxic inorganic, organic contaminants. This work provides a worthy challenge and the future possibility of designing novel alginate materials for various applications.

Keywords: Alginate hydrogel, Dye, Heavy metals, Adsorption, Adsorption capacity.

INTRODUCTION

The present worldwide concern on the toxicity of water pollutants such as, toxic inorganic elements, organic dyes, pharmaceutical and other industrial organic wastes is a great challenge in developing countries [1-7]. The agricultural and industrial discharges with toxic inorganic and organic pollutants are non-biodegradable water contaminants that lead to serious health hazards in human beings through the food chain [8-11]. Some organic and inorganic pollutants were encountered as worst contaminants in water bodies with persistent nature that adversely affect the aquatic environment [12]. Hence there is more interest to explore an efficient methodology for pollutant removal from contaminated water. A few remediation techniques were utilized for the evacuation of harmful toxins, for example photocatalytic degradation [13], chemical precipitation [14], reverse osmosis [15], adsorption [16-18], *etc.*,

Some skill methods used in treatment are costly, difficult for operation and time consuming, however an advantageous simple and high efficient treatment method in the removal of pollutants is adsorption. In literature, preparation of alginate hydrogel was used as efficient adsorbents with good adsorption performance in removal of dyes, heavy metals, pharmaceutical, other organic wastes. Also some alginate hydrogel composites prove to be promising materials in removal of toxic organic and inorganic contaminants and this has created interest to various researchers and scientists to develop novel alginate hydrogel adsorbents with unique properties and superior adsorption performance in treating contaminated water.

Alginate hydrogel adsorbents: Sodium alginate is a nontoxic and inexpensive natural polysaccharide [19-21] having hydroxyl and carboxyl groups that can be effectively crosslinked with Ca^{2+}, Fe^{3+}, Y^{3+} ions. Alginate is usually modified using varying physico-chemical process to increase its

Indian astronomical tables – a study with special reference to *Makarandasārinī*

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Among the astronomical tables belonging to different schools of astronomy (*pakṣas*), *Makarandasāriṇī* (*MKS*) is the prominent and most popular text. This article highlights the important aspects of *MKS* like making of almanacs (*Pañcāṅga*), finding the equation of centre, equation of conjunction, moments of solar ingress into zodiacal signs and 27 lunar mansions (*nakṣatra*), and so on. A detailed study of the work done on *MKS* and further scope of research are also discussed.

Keywords: Almanac, astronomical tables, lunar mansions, *Makarandasāriṇī*, solar ingress.

THERE are various astronomical tables recorded in different forms in Sanskrit in a variety of ways for more than 2000 years, in the form of ancient hymns, mathematical functions, numeric array tables used to generate calendars and ephemeris[1].

The annual Indian calendrical-cum-astronomical almanacs are compiled with the help of traditional astronomical tables. These tables are differently called as *Sāriṇī*, *Padakam*, *Koṣṭhaka* and *Vākya*. There are a large number of tables belonging to different schools (*pakṣa*) like Saura, Ārya, Brāhma and Gaṇeśa. These schools of astronomy are conformed to the parameters and procedures of *Sūryasiddhānta* of Āryabhata I (476 CE), *Brahmasphuṭa siddhānta* of Brahmagupta (628 CE) and *Grahalāghava* of Gaṇeśa Daivajña (1520 CE).

The major tables of the *saurapakṣa* are (i) *Makarandasāriṇī* by Makaranda (1478 CE), (ii) *Gaṇakānanda* by Sūryacārya, son of Bālāditya (16 March 1447), (iii) *Rāmavinoda* by Rāmacandra (1590 CE), (iv) *Ravisiddhāntamañjarī* by Mathurānātha Śukla (1609 CE), (v) *Pratibhāgī* and (vi) *Tyāgarti* manuscripts. The *Gaṇakānanda* of Sūrya is a *karaṇa* text (handbook) popular mainly in Andhra Pradesh and Karnataka. *Pratibhāgī* and *Tyāgarti* tables are used by the *saurapakṣa* followers in Karnataka[2].

The important tables belonging to *Brāhmpakṣa* are *Brahmatulyasāriṇī* (epoch 1183 CE), *Mahādevī* by Mahādeva (1316 CE), *Jagadbhūṣaṇa* by Haridatta (1638 CE) and *Khecaradīpikā* by Kalyāṇa (1649 CE).

Tithichintāmaṇi (1525 CE) and *Grahalāghavasāriṇī* (epoch, 18 March 1520 CE) are the tables based on *Grahalāghava* of Gaṇeśa Daivajña. Among the practitioners

of the Gaṇeśa *pakṣa* based on Gaṇeśa Daivajña's *Grahalāghava* (GL), the astronomical table called *Tithichintāmaṇi* is most popular. It involves different tables for the calculation of the ending moments of lunar day (*tithi*), lunar mansion (*nakṣatra*), etc. Once an almanac maker obtains the required annual constants for *tithi*, *nakṣatra*, etc. for the beginning of a solar year, the rest of the work is simple and rather mechanical. One needs to add or subtract the related elements, using the tables in the text, for successive days[2].

There are tables belonging to other schools as well. In fact, the *vākya* tables used mainly in Kerala and Tamil Nadu composed by the legendary Vararuci comprise Sanskrit sentences which are numerical chronograms based on the *kaṭapayādi* system. Unlike the other Indian astronomical tables, the *vākya* system comprises simple Sanskrit sentences in which each letter represents a number following the *katapayādi* system. The significant achievement of the *vākya* system is that true position of each planet is given in simple sentences. The *vākya* system prevents the elaborated procedures of repeatedly determining and applying the equation of centre and equation of conjunction to obtain the true position. Interestingly, this system of astronomical tables scores over other types of Indian astronomical tables. The number represented by these sentences (*vākyas*) gives directly the true positions of the heavenly bodies. The *vākya* system is based on *Āryapakṣa* by Āryabhaṭa I.

Indian astronomical tables may also be classified into three types based on their arrangement as (i) mean linear, (ii) true linear and (iii) cyclic. In the mean linear arrangement, mean motion tables are accompanied by the tables of equations. *Grahalāghavasāriṇī*, *Ravisiddhāntamañjarī*, *Makarandasāriṇī* and *Brahmatulyasāriṇī* are mean linear-type tables. In true linear mean motion tables are accompanied by the true longitude tables, whereas in the cyclic arrangement true longitudes are given for several years of the goal-year periods. *Mahādevī*, *Rāmavinoda* and *Khecaradīpikā* are examples of true linear tables. *Jagadbhūṣaṇa* by Haridatta is a cyclic table[2].

Makarandasāriṇī

Makarandasāriṇī (*MKS*) is the most popular Sanskrit text containing a large number of astronomical tables. The major tables in *MKS* are for (i) the ending moments of lunar

Double-diffusive penetrative convection in a fluid overlying a porous layer

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ARTICLE INFO	ABSTRACT
	In the present study, the commencement of double-diffusive convection with an internal heat source is studied using a linear instability analysis. The system consists of a fluid layer on top of a porous layer saturated with the same fluid. The boundaries are insulating to temperature perturbations, and the regular perturbation technique is applied to obtain the Rayleigh number. The results of detailed stability characteristics are presented for crucial physical factors, such as thermal Rayleigh number, the inverse Lewis number, depth ratio, the solute Rayleigh number, and heat source strength. © Published at www.ijtf.org

1. Introduction

Double-diffusive convection, which depicts convection driven by two separate density gradients, has sparked many research activities in recent years because of its broad range of applications. Some unique areas of application include the growth of metal crystals, solar ponds, insulation of buildings and equipment, energy storage and recovery, geothermal energy extraction and reservoirs, dispersion of pollutants in the environment, the underground disposal of nuclear wastes and material and food processing (Nield [1], Straughan [2]). Among the most recent contributions are (Capone et al. [3], Chaya and Gangadharaiah [4], Malashetty and Biradar [5], Malashetty et al. [6], Gangadharaiah et al. camse [7], Chang [8], Hill and Carr [9], Hill and Straughan [10]).

Convective motion in composite layers due to volumetric heating has attracted immense attention in the current past because of its prevalence in energy-related and geophysics engineering problems, including underground disposal of radioactive waste materials, heat removal from nuclear fuel debris, storage of food-stuff, exothermic chemical reactions in the packed-bed reactor and so on. Recent contributions include (Carr [11], Suma et al. [12], Khalili et al. [13], Gangadharaiah et al. [14], Shivakumara et al. [15], Gangadharaiah[16], Gangadharaiah and Ananda [17], Straughan[18], and Gangadharaiah and Suma[19]).

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Cisplatin and Nano-particle Form
Cisplatin for Cancer Therapy

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Thermal analysis of Friction Stir welded Steel and Aluminum materials with varying Pre-heat temperature

Prashant S. Humnabad & , S.B. Halesh

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Abstract

The objective of this work is to carry out a thermal heat transfer study to acquire the time dependent temperature field in welding process of FS-Welded dissimilar materials with vary in preheat temperature. Joints were made with four mm thick Aluminum and Steel plates. Parameters selected for current study was temperature (100°C, 150°C and 200°C), rotational speed (1000, 1400, and 1800) rpm and traverse speed (16, 20, and 24) mm/min. In numerical model, welded plate was modeled as the weld line is the symmetric line. The work-piece has dimensions of 100x100x4 mm. The obtained result was compared with experimental result, which shows good agreement and within the acceptable limit. The peak temperature at the weld zone increases significantly with respect to increase in process time.

Introduction

Dissimilar materials like Aluminum and Steel are hard to join by fusion welding method, it's because formation of hard (or) brittle intermetallic compounds at the weld interface. Therefore, a unique method is desired to join these materials, such as Solid-State-Welding (Friction Stir Welding) method and is more suitable than other welding processes [1], [2], since, it needs minimum diffusion bonding time as compared to other joining methods. This method may also be adopted to weld various ferrous and non-ferrous materials and also, suitable to join metal matrix composite materials or plates [3], [4]. In this process the work-pieces are joined under the pressure or combination of both heat and pressure. The work-piece remains in the solid state as the temperature will not be more than the melting point of the base metal. If additional heat is applied, it must be lower than the base metal (steel, since only this material is preheated during the joining process) melting point temperature.

Section snippets

Thermal analysis of welded Joints

The welding simulation is based on sequentially coupled thermo-mechanical problem. To gain the time dependent temperature field in the welding process; a systematic thermal heat transfer analysis is made. In this analysis moving heat source, temperatures depending on thermal properties are considered [5]; from the weld region, area of cross section of weld is used according to heat input.

To simulate the accumulation of weld metal in finite element model, one method is to divide welded area into …

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Influence of tool offset on mechanical properties of solid-state-welded steel and AA7XXX joints

Prashant S Humnabad ✉

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Abstract

The objective of present work is to analyze the role of tool offset on mechanical properties of Friction Stir welded (dissimilar materials) AA7XXX and Steel joints. The major process parameters opted for current experimental study are, Tool Offset (T-OF), Tool Rotation Speed (TRS), and Tool Travel Speed (TTS). Tungsten Carbide (K-12) tool with cylindrical tapered pin is used to produce dissimilar butt welds. Steel plate is kept on advancing side and aluminum on retreating side during the joining process. Tensile, Impact, Bending and Hardness analysis are performed to assess the joint strength. Vickers Micro-hardness test was done along transverse direction of the joint to obtain hardness distribution at weld nugget. Experimental study divulge that, at tool rotational speed of 1400 rpm, tool travel speed of 16 mm/min and offset of +1 mm towards steel (advancing side) yields better results, i.e. around 23.3% improvement as compared to tool at zero offset.

Introduction

In the present experimentation to join ferrous and Non-ferrous materials (Steel and Aluminium) Solid-State-Welding (Friction-Stir-Welding) technology is adopted. A cylindrical FS-Tool with tapered shape pin profile is impinged (plunge) into the plates of interests to be joined (either it may be left or right to the butted line). The tool traverse speed is initiated only after complete pin (while it is rotating) is plunges into the work-piece (plates) and held it at this state for few seconds (dwell time), so that sufficient amount of heat will be generated (i.e., at the surface and edges of the butted plates). This is due to rubbing action between tool shoulder with plate surface and tool pin with edges of the plate. This generated heat will soften the material around the pin which initiates the plastic deformation of the materials to be joined.

After this dwell time tool traverse is initiated along the weld line; due to the material movement takes place from advancing side to the retrieving side formation of a weld between butted plates. The technology adopted for this work is most economical method to join ferrous and non-ferrous materials. Since in this method of joining there is no additional filler material is used; which won't add any additional weight to the structure (which definitely saves cost in many ways) and also, during this process negligible amount of smoke is formed (i.e., less impact on the environment and also, on operator's health). This method is widely used in industries like automobile, shipping, aerospace, oil and gas (piping) and etc… [1]. S. M. Howard et al. [2], suggested various types of tools profiles can be used to join commercial yttria (Y2O3) dispersion-strengthened ferritic steel alloy or advanced ferritic steels. G. Madhusudhan Reddy et al. [3] tool used W-Mo base tool to weld maraging steel with FSW technique and reported a significant improvement in strength as compared to base material about 27%.

Masayuki Aonuma et al. [4] investigated the tool offset effect to join 2 mm thick ZK60 (Mg-Zn-Zr alloy) and titanium plates butt joined plates, by choosing tool offset towards titanium plate and probe inserted into ZK60 plate. It was observed a thin reaction layer formed at the joint interface due to alloying elements Zn and Zr and also improved the tensile strength. Anil Kumar et al. [6], reported the tool rotational speed and traverse speed have significant effect on tensile strength of Friction Stir Welded dissimilar aluminum alloys with H-13 tool. Friction between tool and work-piece is primary contributor for production of heat. P. J. Konkol et al. [7] carried experimental investigations to join 03 m long and 06 mm thick plate of HSLA-65 to see effect on tool geometry. T. Deb Roy et al. [8], discussed results of optimized tool life and effects on microstructure during welding of steel a three-dimensional heat and mass flow model was established.

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Investigation on tensile behavior of glass-fiber reinforced polymer matrix composite with varying orientations of fibers

Prashant S. Hatti [a] ⊠ , Sampath Kumar L. [b], Anupama B. Somanakatti [c], Rakshith M. [d]

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Abstract

The main objective of this work is to develop a new polymer based composite material having different reinforcement angle orientations and studies its tensile behavior. For fiber reinforced polymer matrix composites E-2 glass fiber reinforcement and epoxy resin for matrix is used. E-2 g1ass fiber has high strength, chemical resistance and good insulating properties. Epoxy being less viscous allows good adhesion to fibers used in laminate preparation, without misalignment of fibers. Hand layup technique has been adopted for preparation of laminate. Glass fibers are laid, mixture of epoxy resin and hardener is smeared on it alternately, until laminate of desired thickness is achieved, and is left to atmosphere for curing. 2.5mm laminate is prepared by placing glass fibers of 0.25mm thickness one above the other. The prepared laminate is then taken for cutting according to ASTM standards (D3039) of 3 sets of rectangular specimens. For first set comprises of 90° angle-oriented specimen, second and third sets for 45° and 30° respectively. These specimens are subjected to tensile test in Lloyd UTM and load being applied gradually at the rate of 2mm/min is continued until the material fails. The computer simulation plots the graph during the entire testing process and stops when the material fails.

Introduction

Past decades are focused on development of glass fiber reínforced polymer matrix composite due to the fact that, they have many technological advantages such as high specific strength, low weight, greater stiffness and long life compared to metals. Lee [1] reported vibrational analysis of multi delaminated beams and experimented on composite beams' longitudinal and lateral multiple delamination. The results concluded that, multiple delaminations significantly affect the dynamic characteristics of composite laminated. O'Brien et al. [2] investigated the transverse tension fatigue life characterization through the flexural testing of composite materials. Transverse tension fatigue life of glass- epoxy & carbon-epoxy is characterized by using flexural test on 90° 1aminates placed on three point bending & four point bending. Kant et al. [3] presented analytical formulations and solutions to the static analysis of simply supported composite sandwich plates in view of an higher order refined theory developed by the first main creator. To determine the failure of mechanically fastened fiber reinforced laminated composite joints Okutan [4] carried out a numerical and experimental investigation. E/glass–epoxy composites were used to fabricate the joints by taking the mechanical properties and qualities of the composite tentatively. Zhang et al. [5] studied on inter laminar shear fracture of chopped strand mat glass fiber-reinforced polyester laminates both experimentally and analytically. Lap shear (double-grooved) specimens were used to measure the inter-laminar shear strength and the cracking mechanism was studied using photomicrography. The finite element method was used to calculate the stress distribution along the shear surface and the mixed-mode stress distribution along the shear surface. To study the relationship between the predicted furthermore trial experimental data of the impact response of an reinforced composite laminate Okoli et.al [6], [7] conducted an investigation. The FEA was used to simulate impact behavior of fiber reinforced composites. High strain rate properties obtained by extrapolating results of experiments conducted at low to intermediate strain rate were used in FEA of simple three-point bend beam impact. In earlier studies, Venkatesha B K et al. [8], [9], [10], [11] investigated the influence of stacking sequence of multi layered woven bamboo and glass fibers reinforced with epoxy matrix composites.

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Study on flexural behavior of glass-fiber reinforced polymer matrix composite

Prashant S. Hatti [a], Harisha P. [a] ⚲ ✉ , Sampath Kumar L. [b], Anupama B. Somanakatti [c], Rakshith M. [d]

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Abstract

The primary goal of this research is to analyze a new polymer-based composite material with various reinforcement angle orientations and to investigate its flexural behavior. E-2 glass fiber reinforcement and epoxy resin for matrix are used in fibre reinforced polymer matrix composites. Three sets of rectangular specimens are prepared according to ASTM standards (D7264). First set comprises of 30° angle-oriented specimen, second and third set comprises of 45° and 90° respectively. These specimens are subjected to flexural test in UTM and load being applied gradually until the material fails. It is evident from the results that the load bearing capacity of 90° orientation laminate is more when compared to 30° and 45°.These experimental results are compared with FEA results and found to have a good correlation.

Introduction

Composite material improves construction efficiency by reinforcing fibres in a polymer matrix, resulting in a new structure known as hybrid composite, which has a wide range of material properties. As a result, mechanical properties such as hardness, tensile strength, compression strength, and flexural strength must be investigated in order to apply the material for various applications. On the application of bending load, the deflection of test specimen takes place in such a way that upper portion of specimen is subjected to compression and the lower portion is subjected to tensile stress. Also, the mid-plane is subjected to shear stress. Because of the anisotropic nature of the specimen under investigation, combined stresses resulting on the account of tensile, shear and compressive force caused bending failure.

Jagannatha [1] investigated that the flexural properties of Carbon Fiber Reinforced Concrete (CFRP) and found that the strength of 60 percent carbon fiber reinforced composite is 64.9 percent higher than that of the 60 percent glass fiber reinforced composite and 29.23 percent higher than that of the 30 percent glass fiber and 30 percent carbon reinforced hybrid composite. The strength of hybrid composites is lower than that of carbon fiber reinforced composites, but it is much higher than that of other composites. Junaid [2] not only investigated the load, strain and deflection in concrete and re-bars, but also failure modes and cracks. All of the tested beams have identical flexural and deflection properties. The results show that geopolymer concrete and fiber-reinforced geopolymer concrete beams are more efficient than ordinary concrete for a GFRP reinforced framework. Tolessa1 [3] presented the effect of increasing the weight percentage of jute fiber reinforcement in polypropylene (PP) based composites, it was thereby reported that, on increasing the jute percentage by weight, improved the mechanical properties up to 40%. Mohammed [4] suggested that, the physio-mechanical and thermo-chemical properties of natural fiber/polymer composites could be improved by subjecting the natural fibers to chemical treatment, through which, the adhesion properties between fibers and matrix increases. Bazli [5] reported various findings on FRP composites' behaviors at elevated temperatures. Kelly [6] studied the tensile and flexural characteristics of sheet molded compound (SMC) and found out that failure force depends upon the volume fraction. Ayub [7] the flexural models' results were satisfactory with the experimental stress values of the Fiber Reinforced Concrete (FRC) beams, and the FEA results. In earlier studies, Venkatesha B K et al. [8], [9], [10], [11] investigated the influence of stacking sequence of multi layered woven bamboo and glass fibers reinforced with epoxy matrix composites.

An artificial intelligence solution for crop recommendation

Varshitha D. N., Savita Choudhary
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Article Info	ABSTRACT
	Agriculture is the major occupation in India. The development of India is in the hands of farmers. Farmers are said to be our nation's backbone, so there is a need to support our farmers technologically so that the difficulties of traditional agricultural practices would be overcome and also there will be positive impact on the yield, harvest, healthy crop output and the income of the farmers. Farmer needs awareness about his soil and the methods to improve his soil to grow the healthy crops. We propose an approach which involves deep learning and some IoT features to help our farmers. Soil parameters such as nitrogen, phosphorous, potassium (NPK), pH, organic carbon, moisture content and few more things are considered for predicting the fertility of the soil and also to predict the right crops to be grown and nutrition required for it. We have developed a deep neural network model to predict the crop which can be suitably grown in the soil. We have also implemented the other machine learning classifiers on the same collected dataset to test the accuracies of each classifier and our deep neural network model.

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1. INTRODUCTION

Majority of rural India is still dependent on agriculture for the livelihood; also agriculture is the biggest sector of economy. Though India has revolutionized in the area of agriculture, still there is scope for improving the methods of agriculture and crop yield enhancement using more scientific and innovative approaches. A lot of researches happen in the area of agriculture every day. Farmers still resist to apply modern techniques for agriculture because of difficulty faced in getting adopted to new approaches [1], [2]. If the approaches are easily accessible with cost and time efficient methods, then the number of farmers switching to modern techniques from tradition way will be more. Agriculture is not only the main sector of economy, it also provides food to people and gives the raw materials to industries. The growing demand to provide food also encourages to improve the agricultural methodologies

A lot of farmers still need awareness about the soil to promote healthy crop growth and to increase the yield and income. Soil is the vital component of agriculture. Information regarding the soil like fertility, estimated yield, lacking components in the soil, the crops which can be grown from the soil and many more soil related things would be beneficial to all the farmers to choose the correct crops which can be grown in their land, farmer should know which crop's growth is facilitated and which are not so that unpredictable circumstances are avoided after sowing the seeds. If farmer grows the crops by considering his economic conditions, soil parameters and available facilities, it would turn into a boon for him in future as he can expect healthy crop growth, more yield and better income. So, if farmers are guided in this right direction using modern technologies, well-being of the farmers are assured and country's growth is also possible.

A bootstrap aggregation approach for adequate crop fertilizer and nutrition recommendation

Varshitha D. N., Savita Choudhary
Department of Computer Science and Engineering, Sir M. Visvesvaraya Institute of Technology, Bengaluru, India

Article Info	ABSTRACT
	Agriculture is the largest workforce of India and biggest contributor to the Indian economy. Improving agricultural practices with the help of modern computer science technologies have great scope. Helping the farmers to know about their soil fertility, crops which can be grown and fertilizers or nutrients required for their land will be valuable inputs for them. Too much or too little fertilizers may harm the soil, so right amount of fertilization is also important. In this paper we have discussed about the bootstrap aggregation regression method, which is an ensemble machine learning technique to recommend the optimum level of nutrients and fertilizers. Hence customized nutrients recommendation reports could be generated to suggest the fertilizers and nutrients with their adequate quantities. This will be really beneficial for farmers to maintain the soil health and helpful for better crop growth and yield. We consider the features and levels of soil parameters such as nitrogen, phosphorus, potassium (NPK), pH level, organic carbon, electric conductivity, humidity, rainfall and other micro nutrients for predicting the right amount of fertilizers and nutrients. We have also checked other regression methods to compare the results based on the previous work done in the same field. *This is an open access article under the <u>CC BY-SA</u> license.*

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1. INTRODUCTION

There is always a scope for improvement in the area of agriculture to reduce the burden on farmers and guide them in right direction. The low productivity of agriculture always is a challenge, to meet the need to supply the food for people and raw materials to industries. Low soil fertility, poor soil health, lack of proper knowledge about fertilizers and pesticides, minimum knowledge about the soil properties and actions needed to improve the soil are few reasons of low productivity of crops [1], [2].

Soil in its original form contains several macro and micro nutrients like nitrogen, phosphorus, potassium (NPK), sulphur, copper, iron, and manganese. Also some features like pH, humidity, temperature, rainfall, monsoon cycles and type of the soil are all necessary for any individual crop to grow in the soil [3]–[6]. Even a single nutrient deficiency may lead to abnormal growth of crops or plants. Plants need all the components of soil in its optimum level to grow healthy. More crop yield is possible only when soil is healthy enough to grow the crops.

Fertilizers act like boosters to improve the fertility of the soil and facilitate the crop growth and they fill the necessary portion of the soil which is missing, so the requirements of the soil can be satisfied by using fertilizers in soil. Always the right amount of fertilization is considered important. Too much or too little nutrition is dangerous for crop growth and soil health. So adequate quantity of each substance should be

BRAIN TUMOR DETECTION THROUGH IMAGE SEGMENTATION

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ABSTRACT

Brain cancers (e.g. glioblastomas) are some of the deadliest types of cancers and are some of the most difficult to treat due to their anatomical location. Early tumor detection is crucial for a good prognosis but oftentimes the diagnosis is difficult because the tumor is too small and not easily detectable.The segmentation of brain tissue in an MRI (magnetic resonance image) is critical for detecting the existence of outlines related to a brain tumor. Traditional diagnosis techniques include a brain scan (i.e. MRI), which can be time-consuming for doctors to analyze. An alternative, efficient technique for diagnosis (analysis of the MRI) is the use of machine learning, which can be used with an image classifier for fast and accurate detection. Here, we used open-source MRI datasets that are trimmed and resized for accurate results. We implement TensorFlow's Convolutional Neural Networks (CNN) as the architecture for our model. The images that we used in our algorithm were made up of 46% that had tumors and 54% that were not cancerous. The program takes about 3.47 seconds to load the model and produce predictions. Our model has a validation loss of 0.122 and a 99.50% max validation accuracy. Although our model focuses on brain tumors, its use can be extended to other types of cancers that are diagnosed with similar methods (e.g MRI). In addition, the suggested method guarantees that brain tumor detection, classification, and segmentation would be exceedingly efficient and exact.This model is written in Python 3 using the Tensorflow library and uses Keras to build a neural network to classify images. Importantly, the training data was cleaned and cropped to unnecessary backgrounds. After the training, the model and its weights were saved to a file.This interface is built using Streamlit and uses this mechanism to allow for a fast and intuitive analysis of given data.

Keywords: Brain tumor detection,CNN.