3.4.5 Citation Index

The following are the bibliometric of the publications for the academic year 2017-18 based on average Citation index in Scopus and Web of Science.

Table 1: Citation Index for Publication in Scopus

S.No	Title of the paper	Name of the Authors	Title of the Journal	Year of the Publication	Citation Index
1.	Effect of partial slip and chemical reaction on convection of a viscoelastic fluid over a stretching surface with Cattaneo-Christov heat flux model	Eswaramoorthi S., Bhuvaneswari M., Sivasankaran S., Niranjan H., Rajan S.	IOP Conference Series: Materials Science and Engineering	2017	10
2.	A personalized recommendation engine for prediction of disorders using big data analytics	Shobana V., Kumar N.	IEEE International Conference on Innovations in Green Energy and Healthcare Technologies - 2017, IGEHT 2017	2017	5
3.	Convection in a sinusoidally heated square enclosure utilizing Ag−water nanofluid with heat generating solid body	Umadevi P., Nithyadevi N.	International Journal of Mechanical Sciences	2017	8

4.	In vivo antiplasmodial evaluation of Syzygium jambos L. Alston by four day suppressive test	Devakumar J., Sudha S.S.	Drug Invention Today	2017	1
5.	Optimization of alpha amylase for better dough preparation	Maria F.S., Rajamani R., Bheeman D.	Journal of Microbiology, Biotechnology and Food Sciences	2017	2
6.	Biomimetic synthesis, characterization and evaluation of antioxidant, antimicrobial efficacy of silver nanoparticles using anredera cordifolia leaf extract	Rajathi P., Suja S.	Asian Journal of Pharmaceutical and Clinical Research	2017	2
7.	Neighbor node discovery mechanism based delay aware routing protocol (DARP - NND) for cognitive radio ad hoc networks	Kannan M., Jeetha B.R.	2016 IEEE International Conference on Advances in Computer Applications, ICACA 2016	2017	2
8.	Antioxidant and chemotherapeutic potential of curcuma amada rhizome extract on benzo(A)pyrene induced cervical carcinoma in sprague dawley rats	Palanisamy V.D., Samiappan S.	Asian Journal of Pharmaceutical and Clinical Research	2017	2

9.	A graph based similarity measure (GBSM) for finding the semantic relation between the words in microblogs	Suguna K., Nandhini K.	International Journal of Applied Engineering Research	2017	0
10	Comparative study on antimicrobial activity of seaweeds	Sasikala C., Geetha Ramani D.	Asian Journal of Pharmaceutical and Clinical Research	2017	4
11	Unaffected serial prophecy based filter technique (USP-FT) for noise removal in facial expression recognition images	Dinesh Kumar P., Rosiline Jeetha B.	International Journal of Civil Engineering and Technology	2017	2
12	Perspectives on educational data mining: A study	Nandha Kumar K.G., Jayanthila Devi A.	Man in India	2017	1
13	Preparation and characterization of Groundnut shell activated carbon as an efficient adsorbent for the removal of Methylene blue dye from aqueous solution with microbiostatic activity	Kamaraj M., Umamaheswari P.	Journal of Materials and Environmental Science	2017	14

14	Identification of bioactive compounds by gas chromatography-mass spectrometry analysis of Syzygium jambos (L.) collected from Western Ghats region Coimbatore, Tamil Nadu	Devakumar J., Keerthana V., Sudha S.S.	Asian Journal of Pharmaceutical and Clinical Research	2017	11
15	Effect of chemical reaction and heat generation on 3D double diffusive convection over a stretching plate: Numerical and analytical study	Eswaramoorthi S., Sivasankaran S., Alshomrani A.S.	Journal of Physics: Conference Series	2018	0
16	Effect of thermal radiation and heat absorption of MHD Casson nanofluid over a stretching surface in a porous medium with convective heat and mass conditions	Eswaramoorthi S., Sivasankaran S., Alshomrani A.S.	Journal of Physics: Conference Series	2018	3
17	Computation of total eccentricity using python program	Manimekalai S., Mary U.	Journal of Physics: Conference Series	2018	0

18	Thermal radiation and cross diffusion effects on 3D convective flow of a viscoelastic fluid over a stretchy paper with chemical reaction	Bhuvaneswari M., Eswaramoorthi S., Sivasankaran S.	Journal of Physics: Conference Series	2018	2
19	Solving linear programming problem by means of fuzzy Z numbers	Revathy M., Sahaya Sudha A.	Journal of Physics: Conference Series	2018	0
20	Computation of topological Indices using python program for chemical graph structure	Manimekalai S., Mary U., Lavanya M.	Journal of Physics: Conference Series	2018	3
21	Buoyant convection in porous annulus with discrete sources-sink pairs and internal heat generation	Sankar M., Kemparaju S., Prasanna B.M.R., Eswaramoorthi S.	Journal of Physics: Conference Series	2018	6
22	Study of structural, morphological, optical and biomedical properties of pH based ZnO nanostructures	Magesh G., Bhoopathi G., Arun A.P., Ranjith Kumar E., Srinivas C., Sathiyaraj S.	Superlattices and Microstructures	2018	11
23	Structural, optical and electrical properties of ZnO-ZnS nanocomposites prepared by simple hydrothermal method	Sundararajan M., Sakthivel P., Fernandez A.C.	Journal of Alloys and Compounds	2018	21

24	Psidium guajava leaf extract-mediated synthesis of ZnO nanoparticles under different processing parameters for hydrophobic and antibacterial finishing over cotton fabrics	Saha R., Subramani K., Petchi Muthu Raju S.A.K., Rangaraj S., Venkatachalam R.	Progress in Organic Coatings	2018	28
25	Formulation and characterization of papain loaded solid lipid nanoparticles against human colorectal adenocarcinoma cell line	Chandran S.P., Nachimuthu K.	Asian Journal of Pharmaceutical and Clinical Research	2018	0
26	An efficient web log file classification techniques to identify the fault data identification using multi-class support vector machine algorithm	Kanna R.R.	Journal of Computational and Theoretical Nanoscience	2018	0
27	In vitro and in vivo antiangiogenic effect of artocarpus heterophyllus seed extract	Thiruselvi M., Durairaj B.	Asian Journal of Pharmaceutical and Clinical Research	2018	0
28	Bioaccumulation of Transition Metal Oxide Nanoparticles and Their Influence on Early Growth Stages of Vigna unguiculata Seeds	Suriyaprabha R., Sreeja K.A., Prabu M., Prabu P., Rajendran V.	BioNanoScience	2018	3

29	Influence of solvents on the changes in structure, purity, and in vitro characteristics of green-synthesized ZnO nanoparticles from Costus igneus	Nandhini G., Suriyaprabha R., Maria Sheela Pauline W., Rajendran V., Aicher W.K., Awitor O.K.	Applied Nanoscience (Switzerland)	2018	9
30	Free radical scavenging activity from hydroethanolic extracts of Artocarpus heterophyllus seeds	Durairaj B., Thiruselvi M.	Drug Invention Today	2018	0
31	Enhancing the thermophysical and tribological performance of gear oil using Ni-promoted ultrathin MoS2 nanocomposites	Rajendhran N., Palanisamy S., Shyma A.P., Venkatachalam R.	Tribology International	2018	16
32	Effects of multiple slip on MHD combined convective flow of viscoelastic nanofluid over a stretchy sheet with heat absorption	Eswaramoorthi S., Sivasankaran S., Bhuvaneswari M., Rajan S.	IOP Conference Series: Materials Science and Engineering	2018	4
33	Fuzzy mechanism for Gaussian noise reduction for satellite image enhancement	Maheshwari S., Krishnapriya P.	Journal of Theoretical and Applied Information Technology	2018	1

34	Acceleration artificial bee colony optimization-artificial neural network for optimal feature selection over big data	Meera S., Jeetha B.R.	IEEE International Conference on Power, Control, Signals and Instrumentation Engineering, ICPCSI 2017	2018	1
35	Dynamic and reliable intelligent data mining technique on social media drug related posts	Renuka D.K., Jeetha B.R.	IEEE International Conference on Power, Control, Signals and Instrumentation Engineering, ICPCSI 2017	2018	2
36	Pharmacological benefits of neferine - A comprehensive review	Marthandam Asokan S., Mariappan R., Muthusamy S., Velmurugan B.K.	Life Sciences	2018	29
37	Preparation and characterization of alkaline electroless Ni-B nano deposition on mild steel in the presence of Azadirachta indica gum	Dheenadhayalan S., Nijarubini V., Mallika J.	Rasayan Journal of Chemistry	2018	0

38	Papain loaded solid lipid nanoparticles for colorectal cancer therapy	Chandran S.P., Nachinmuthu K.P., Natarajan S.B., Inamdar M.G., Shahimi M.S.B.M.	Current Cancer Therapy Reviews	2018	7
39	Occupational exposure to photocopiers and their toners cause genotoxicity	Kasi V., Elango N., Ananth S., Vembhu B., Poornima J.G.	Human and Experimental Toxicology	2018	7
40	Heterogeneous and homogeneous reaction analysis on MHD oldroyd-B fluid with cattaneo-christov heat flux model and convective heating	Eswaramoorthi S., Bhuvaneswari M., Sivasankaran S., Makinde O.D.	Defect and Diffusion Forum	2018	11
41	Synergistic effect between Gum Exudates of Eucalyptus globles and 2,6-diphenyl-3-methylpiperidin-4-one on Corrosion Inhibition of MS in 1N HCl	Dheenadhayalan S., Roja R., Nijarubini V., Mallika J.	Oriental Journal of Chemistry	2018	0
42	Immunostimulatory potential of papain encapsulated solid lipid nanoparticles	Chandran S.P., Nachimuthu K.	Journal of Applied Pharmaceutical Science	2018	0

43	Light trapping and power conversion efficiency of P3HT : nano Si hybrid solar cells	Vinoth M., Arunmetha S., Sridharpanday M., Karthik S., Rajendran V.	RSC Advances	2018	0
44	Energy-based efficient authenticated routing protocol for MANETs for DDOS attacks with minimised power consumption	Savithri M., Rajesh Babu M.	International Journal of Networking and Virtual Organisations	2018	1
45	A Study on Various Cyber-Attacks and their Classification in UAV Assisted Vehicular Ad-Hoc Networks	Vanitha N., Padmavathi G.	Communications in Computer and Information Science	2018	1
46	Electrochemical Investigation of Eco-friendly Chitosan Schiff base for Corrosion Inhibition of Mild Steel in Acid Medium	Menaka R., Geethanjali R., Subhashini S.	Materials Today: Proceedings	2018	7
47	Characterization of Ca doped CeO2 quantum dots and their applications in photocatalytic degradation	Ramasamy V., Mohana V., Rajendran V.	OpenNano	2018	21

48	Evaluation of wound healing property of Parmelia sp. against diabetic foot ulcer-causing pathogens	Panicker N.S.	Drug Invention Today	2018	1
49	Bioprospecting of marine sponge (Callyspongia diffusa) for antibacterial compound	Bindu D., Vinoth Kumar T., Geetharamani D.	Asian Journal of Pharmaceutical and Clinical Research	2018	2
50	Semiconducting metal oxides for gas sensor applications	Fernandez A.C., Sakthivel P., Jesudurai J.	Journal of Materials Science: Materials in Electronics	2018	5

Table 2: Citation Index for Publication in Web of Science

S.No	Title of the paper	Name of the Authors	Title of the Journal	Year of the Publication	Citation Index
1.	Optimization Of Alpha Amylase For Better Dough Preparation	Maria, Flory Shobana; Rajamani, Ranjithkumar; Bheeman, Dinesh	Journal Of Microbiology Biotechnology And Food Sciences	2017	2
2.	Convection in a sinusoidally heated square enclosure utilizing Ag - water nanofluid with heat generating solid body	Umadevi, P.; Nithyadevi, N.	International journal of mechanical sciences	2017	9

3.	A Personalized Recommendation Engine For Prediction Of Disorders Using Big Data Analytics	Shobana, V; Kumar, N.	2017 ieee international conference on innovations in green energy and healthcare technologies	2017	0
4.	Prevalence Of Overweight And Obesity Among 5-16 Years In Semi-Urban Areas Of Coimbatore, India	Krishnan, Rajendran Nambi; Ramachandran, Gopimohan; Sivasankaran, Balasubramanian	Journal of evolution of medical and dental sciences-jemds	2017	1
5.	Association of Vitamin-D receptor polymorphisms with degenerative disc disease in Indian population	Doraiswamy, Ravichandran; Ramaswami, Karthikeyan; Subramanian, Rashmi; Srinivasan, Dinesh Kumar; Sivasankaran, Balasubramanian	Faseb journal	2017	0
6.	Synergistic effect between Gum Exudates of Eucalyptus globles and 2,6-d phenyl-3-methylpiperidin-4-one on Corrosion Inhibition of MS in 1N HCl	Dheenadhayalan, S.; Roja, R.; Nijarubini, V; Mallika, J.	Oriental journal of chemistry	2018	0

7.	A Study on Various Cyber-Attacks and their Classification in UAV Assisted Vehicular Ad-Hoc Networks	Vanitha, N.; Padmavathi, G.	Computational intelligence, cyber security and computational models: models and techniques for intelligent systems and automation	2018	1
8.	Electrochemical Investigation of Eco-friendly Chitosan Schiff base for Corrosion Inhibition of Mild Steel in Acid Medium	Menaka, R.; Geethanjali, R.; Subhashini, S.	Materials today-proceedings	2018	7
9.	Study of structural, morphological, optical and biomedical properties of pH based ZnO nanostructures	Magesh, G.; Bhoopathi, G.; Arun, A. P.; Kumar, E. Ranjith; Srinivas, Ch.; Sathiyaraj, S.	Superlattices and microstructures	2018	11
10	Production, Purification & Analysis of Enterotoxins from HA-MRSA Isolated from Clinical Samples	Bai, K. Bharathi; Sudha, S. S.	Helix	2018	0

11	Effects of multiple slip on MHD combined convective flow of viscoelastic nanofluid over a stretchy sheet with heat absorption	Eswaramoorthi, S.; Sivasankaran, S.; Bhuvaneswari, M.; Rajan, S.	3rd international conference on materials and manufacturing engineering 2018	2018	0
12	Psidium guajava leaf extract-mediated synthesis of ZnO nanoparticles under different processing parameters for hydrophobic and antibacterial finishing over cotton fabrics	Saha, Raunak; Karthik, Subramani; Kumar, Petchi Muthu Raju Subbiah Arunachala; Suriyaprabha, Rangaraj; Rajendran, Venkatachalam	Progress in organic coatings	2018	27
13	Enhancing the thermophysical and tribological performance of gear oil using Ni-promoted ultrathin MoS2 nanocomposites	Rajendhran, Naveenkumar; Palanisamy, Siva; Shyma, Arunkumar Prabhakaran; Venkatachalam, Rajendran	Tribology international	2018	14

14	Structural, optical and electrical properties of ZnO-ZnS nanocomposites prepared by simple hydrothermal method	Sundararajan, M.; Sakthivel, P.; Fernandez, Alison Christina	Journal of alloys and compounds	2018	19
15	Occupational exposure to photocopiers and their toners cause genotoxicity	Kasi, V.; Elango, N.; Ananth, S.; Vembhu, B.; Poornima, J. G.	Human & experimental toxicology	2018	6
16	Light trapping and power conversion efficiency of P3HT:nano Si hybrid solar cells	Vinoth, Murugan; Arunmetha, Sundaramoorthy; Sridharpanday, Mathu; Karthik, Subramani; Rajendran, Venkatachalam	Rsc advances	2018	0
17	Bioaccumulation of Transition Metal Oxide Nanoparticles and Their Influence on Early Growth Stages of Vigna unguiculata Seeds	Suriyaprabha, R.; Sreeja, K. A.; Prabu, M.; Prabu, P.; Rajendran, V.	Bionanoscience	2018	3

18	Influence of solvents on the changes in structure, purity, and in vitro characteristics of green-synthesized ZnO nanoparticles from Costus igneus	Nandhini, G.; Suriyaprabha, R.; Pauline, W. Maria Sheela; Rajendran, V.; Aicher, Wilhelm Karl; Awitor, Oscar Komla	Applied nanoscience	2018	9
19	Semiconducting metal oxides for gas sensor applications	Fernandez, Alison Christina; Sakthivel, P.; Jesudurai, Joe	Journal of materials science-materials in electronics	2018	6
20	Papain Loaded Solid Lipid Nanoparticles for Colorectal Cancer Therapy	Chandran, Suriyakala P.; Nachinmuthu, Kannika P.; Natarajan, Satheesh B.; Inamdar,	Current cancer therapy reviews	2018	5
21	Prevalence Of Methicillin Resistant Staphylococcus Aureus In Western Tamilnadu	Gandhiraj, D.; Wesely, E. G.; Palanisamy, A.; Sahanapriya, S.	International journal of life science and pharma research	2018	0
22	Pharmacological benefits of neferine - A comprehensive review	Asokan, Shibu Marthandam; Mariappan, Ravichandran; Muthusamy, Shanmugavadivu; Velmurugan, Bharath Kumar	Life sciences	2018	27

Publications in Scopus for Academic Year 2017-18

14th ICSET-2017 IOP Publishing
IOP Conf. Series: Materials Science and Engineering **263** (2017) 062009 doi:10.1088/1757-899X/263/6/062009

Effect of partial slip and chemical reaction on convection of a viscoelastic fluid over a stretching surface with Cattaneo-Christov heat flux model

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Abstract. This article explores the effect of homogeneous-heterogeneous chemical reaction and partial slipon convective flow of a viscoelastic fluid with Cattaneo-Christov heat flux modelin the presence of suction/injection and convective boundary condition. The governing system of non-linear partial differential equations arereformed into ordinary differential equations with the help of similarity variables and then they are solved using homotopy analysis method. It is found that the surface heat transfer rate enhances on increasing the thermal relaxation time parameter and the surface mass transfer rate improved by increasing the slip parameter and homogeneous chemical reaction parameter.

A personalized recommendation engine for prediction of disorders using big data analytics

Publisher: IEEE Cite This PDF

V. Shobana ; N. Kumar All Authors

2 Paper Citations

352 Full Text Views

Abstract

Document Sections

I. Introduction

II. Personalized Healthcare: A Data-Driven Approach

III. Reccommendations in Health Care

Abstract:

Recommender systems has become an important research field since 1990's and its applications includes several domains. The application of recommendations in health care is a very wide area which recommends the patients about their health. Upon vast amount of data prevailing in health care sector, these data can be processed using big data tools to deliver a meaningful prediction to the patients. The predictions and recommendations will be more accurate since we are dealing with vast amount of data. Moreover it alerts the user from the occurrence of disease and takes necessary actions before it occurs. Thus recommender system along with big data will be promising solution that is prevailing in healthcare sector. The sum total of data related to the patient and their well-being constitutes the "Big Data" problem in the healthcare industry.

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Convection in a sinusoidally heated square enclosure utilizing *Ag – water* nanofluid with heat generating solid body

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ARTICLE INFO

Keywords:
Convection
Sinusoidal heating
Heat generating body
Nanofluids

ABSTRACT

In this study, natural convection flow in a square enclosure filled with Ag–water nanofluid and with a heat conducting solid square body are carried out numerically. A two-dimensional solution for steady laminar incompressible flow is obtained by using the finite volume method based on the control volume approach. The study goes further to investigate the effect of the various thermal boundary conditions on the fluid flow and heat transfer inside the enclosure. The area of the solid body is changed at the centerline of the enclosure. Effect of area ratio of solid-enclosure, the thermal conductivity ratio of solid-fluid, solid volume fraction and temperature difference ratio of solid-fluid are studied. The flow and heat transfer characteristics are expressed in the form of streamlines and isotherms, respectively.

1. Introduction

Fluid flow and heat transfer inside differently heated square enclosures has been studied widely for its various applications in engineering and geophysical systems. Physics involved in the buoyancy-driven flow inside a square domain has relevance to a variety of practical problems such as nuclear and chemical energy production systems, crystal growth in liquids, solar energy collection and convective heat transfer associated with boilers and electronics, etc. The simulation of free convection heat transfer inside enclosure was first numerically examined by Davis [1], which was addressed as the benchmark solution of many enclosure problems. Vierendeels et al. [2] fully solved the Navier–Stokes equations for low speed compressible flows to simulate buoyancy-driven flow inside a square domain without resorting to low Mach number approximation or Boussinesq approximation. The low Mach number stiffness which are kept with temperature difference. Lee and Ha [3] numerically investigated natural convection in a horizontal enclosure with a conducting body. They compared the results of the case of conducting body with those of neutral, isothermal and adiabatic bodies and observed that when the dimensionless thermal conductivity is 0.1, a pattern of fluid flow and isotherms and the corresponding surface- and time-averaged Nusselt numbers are almost the same as the case of an adiabatic body. House et al. [4] analyzed the effect of a square solid heat conducting body on natural convection in a square enclosure and concluded that heat transfer across the enclosure reduced or enhanced by a body with a thermal conductivity ratio greater or less than unity. The geometry considered in the numerical study of Oh et al. [5] was the solid conducting and heat generating body inside the enclosure. With these assumptions, it was observed that the flow was driven by a temperature difference caused by the heat-generating source and a temperature dif-

Research Article

In vivo antiplasmodial evaluation of *syzygium jambos* L. Alston by four day suppressive test

J Devakumar, S S Sudha*

ABSTRACT

Objective: The unexplored region of Western Ghats possesses natural source of noble therapeutic floras for many diseases. The present study was aimed to investigate the *in vivo* antiplasmodial activity of *Syzygium jambos* from Western Ghats. **Methods:** The four extracts acetone, chloroform, methanol and aqueous were explore their antiplasmodial activity by Peter's four day test. **Results:** In Peter's four day test significant parasite suppression 99.24% (P<0.001) was observed in Chloroquine (CQ 25mg/kg b.wg.) group prolonging the mean survival time of animals ≥30 days, whereas no average parasitaemia suppression (44.33±0.94) was observed in the negative control group. An effective parasite suppression (P<0.01) of 72.93% and 72.18% was identified in methanol and acetone extracts respectively at 600 mg/kg b.wt. The acetone and methanol extracts prolonged the mean survival days of mice groups up to 27.8 ± 0.68 and 26.0 ± 1.29 days respectively. **Conclusion:** Among the four extracts tested methanol and acetone extracts exhibited antimalarial activity. The present study report establishes, *Syzygium jambos* leaf extracts were effective with an assorted range of antiplasmodial activity and could be a potential source in the discovery of antimalarial drug.

KEY WORDS: Antiplasmodial activity, Chloroquine, *Syzygium jambos*, Western Ghats

INTRODUCTION

Among parasitic infections malaria remains serious health problem worldwide. Globally around 3.2 billion peoples are at malarial risk[1] with 2-3 million deaths occurring each year.[2] In Africa, malaria accounts for 10% of the total disease burden and over 90% of deaths

Paramakudi, Thoothukudi, Kanyakumari, Krishnagiri, Dharmapuri, and Thiruvannamalai, where 56.6% of cases are reported from Chennai, 4.4% from other urban malaria scheme towns, and 39% were reported from rural areas.[6] The continuous upsurge in the global prevalence of malaria stemmed from increasing

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OPTIMIZATION OF ALPHA AMYLASE FOR BETTER DOUGH PREPARATION

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ABSTRACT

Amylases have potential application in a wide number of industrial processes such as food, fermentation and pharmaceutical industries. The present study mainly focused on screening of amylase producing *Bacillus subtilis*, production by solid-state fermentation using rice straw and banana pseudo stem and its optimization for amylase activity in dough preparation, effect on bread making and analysis of bread quality. Maximum production of amylase was obtained after 24hrs of incubation. The optimum pH for enzyme activity was found to be at pH 7 and the optimum temperature for the activity was found to be at the range of 30 – 70°C. The combination of 0.8g yeast and 300 U of amylase gave better results than enzyme alone for the better dough preparation.

Keywords: Amylase, *Bacillus subtilis*, solid state fermentation, optimization

INTRODUCTION

The industrial enzyme producers sell enzymes for a wide variety of applications and approximately more than 25% amylases represent as a class of industrial enzymes of the market **(Sidhu *et al.*, 1997; Rao *et al.*, 1998)**. Starch digesting amylase has found important application in bioconversion of starches and starch-based substrates **(Fogarty *et al.*, 1983)**. Amylolytic enzymes are of great significance in biotechnological applications in food industry, amylases can be synthesized from numerous sources, like plants, animals and microorganisms. The enzymes from microbial sources commonly meet industrial demands and had **Sodhi *et al.*, 2005; Soni *et al.*, 2003)**. The present study mainly focused on screening of amylase producing *Bacillus subtilis*, production by solid-state fermentation using rice straw and banana pseudo stem and its optimization for amylase activity in dough preparation, effect on bread making and analysis of bread quality.

MATERIAL AND METHODS

Isolation Of *Bacillus subtilis* from the environment

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Research Article

BIOMIMETIC SYNTHESIS, CHARACTERIZATION AND EVALUATION OF ANTIOXIDANT, ANTIMICROBIAL EFFICACY OF SILVER NANOPARTICLES USING *ANREDERA CORDIFOLIA* LEAF EXTRACT

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Received: 28 December 2016, Revised and Accepted: 19 January 2017

ABSTRACT

Objective: This study is focused on the biosynthesis of silver nanoparticles (AgNPs) using aqueous extract of *Anredera cordifolia* and to investigate the free radical scavenging potential, antimicrobial activity of the nanoparticles against different human pathogens.

Methods: The formation of AgNPs was indicated by the color change from colorless to reddish brown. Biosynthesized AgNPs were characterized using several techniques, *viz.*, ultraviolet (UV)-visible spectroscopy, Fourier transform infrared, X-ray diffraction (XRD), transmission electron microscopy (TEM), scanning electron microscopy (SEM), and energy dispersive X-ray analysis. The free radical scavenging potential was measured by 2, 2-diphenyl-1-picrylhydrazyl (DPPH), ferric reducing antioxidant power (FRAP) assay, antimicrobial activity against six microorganisms was tested using disc diffusion method.

Results: UV-visible spectral analysis showed silver surface plasmon resonance band at 426 nm. The crystalline morphology and size of the nanoparticles were determined by TEM, SEM, and XRD studies which showed the average size of the nanoparticles in the range 40-60 nm. The biologically synthesized nanoparticles efficiently inhibited pathogenic organisms such as *Escherichia coli, Staphylococcus aureus, Klebsiella pneumonia, Pseudomonas aeruginosa,* and *Proteus vulgaris.* The biosynthesized nanoparticles might serve as a potent antioxidant as revealed by DPPH assay and FRAP assay.

Conclusion: The biosynthesis of AgNPs had several advantages in pharmaceutical applications as well as large-scale commercial production.

Keywords: Silver nanoparticle, *Anredera cordifolia* leaf, Scanning electron microscopy, Transmission electron microscopy, X-ray diffraction, Antioxidant, Antimicrobial.

 DOI: http://dx.doi.org/10.22159/ajpcr.2017.v10i4.16819

INTRODUCTION

Nanotechnology can be termed as the synthesis, characterization, exploration, and application of nanosized (1-100 nm) materials for the development of science. The intrinsic properties of metal nanoparticles are determined by size, shape, composition, crystallinity, and morphology. It is a field of science which deals with production, sensors [10]. AgNP-embedded antimicrobial paint [11] is a promising area of ecofriendly applications. Hence, a variety of techniques including physical and chemical methods have been developed to synthesize AgNPs, the physical methods [12] are highly expensive and chemical methods are harmful to the environment [13]. Therefore, there is a growing need to develop environmentally benign nanoparticle synthesis processes that do not use toxic chemicals in the synthesis

Conferences > 2016 IEEE International Confe...

Neighbor node discovery mechanism based delay aware routing protocol (DARP — NND) for cognitive radio ad hoc networks

Publisher: IEEE

Cite This

PDF

M. Kannan ; B. Rosiline Jeetha **All Authors**

1 Paper Citation

110 Full Text Views

Abstract

Document Sections

I. Introduction

II. Related Works

III. Proposed Work

IV. Simulation Settings and Performance Matrics

Abstract:

Cognitive Radio ad hoc network is a sort of wireless network. Cognitive radios have the ability to sense the wireless medium. Routing is the major research area and ensuring quality-of-service (QoS) is a challenging problem. This paper proposes a neighbor node discovery mechanism based delay aware routing protocol in order to provide QoS in such network. Primary QoS metrics such as throughput and delay can be put into consideration for evaluating the performance of the proposed protocol DARP-NND. Simulations are passed out by means of NS2 and the outcomes confirm that the proposed protocol achieves improvement in provisions of increased throughput and reduced delay.

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Research Article

ANTIOXIDANT AND CHEMOTHERAPEUTIC POTENTIAL OF *CURCUMA AMADA* RHIZOME EXTRACT ON BENZO(A)PYRENE INDUCED CERVICAL CARCINOMA IN SPRAGUE DAWLEY RATS

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ABSTRACT

Objective: To evaluate the antioxidant and chemotherapeutic potential of *Curcuma amada* Rhizome extract on benzo(a)pyrene (BaP) induced cervical carcinoma in Sprague Dawley rats.

Methods: A total of 30 female Sprague Dawley rats were selected to establish cervical cancer model and then divided into 5 groups at random with six mice in each group. Group 1 control, Group 2 BaP (oral), Group 3 BaP for 8 weeks and post-treated with cisplatin (intravenous administration), Group 4 BaP for 8 weeks and post-treated with 250 mg of ethanol extract of *C. amada* (oral), Group 5 BaP for 8 weeks and post-treated with 500 mg of ethanol extract of *C. amada* (oral). 4 weeks after the treatment, the animals were sacrificed, serum separated, and cervical tissues were dissected. Antioxidants and the markers carcinoembryonic antigen (CEA), cancer antigens (CAs) 125, gamma glutamyltransferase (GTT) were assayed in serum and the tissue was used for analyzing tumor burden and sectioned for histopathological assays.10% tissue homogenate was estimated for antioxidants and membrane-bound enzymes.

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A Graph Based Similarity Measure (GBSM) for Finding the Semantic Relation between the Words in Microblogs

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Abstract-

This paper introduce a new graphics model for micro blogs to understand the mostly inference topics. The twitter deals with more than hundred billions of tweets per day, so it is not an easy task to find the recurrent topics. Twitter are the one of the leading social networking site where the people can share their arousing and opinion. The tweets are very petite text, noisy and unstructured. Tweets are constantly screening up with rich user-generated[1]. The constructs the semantic relationships to each other and also provides a way to connect the semantically related and co-occurred word. The proposed method Graph Based Similarity Measure (GBSM) define a

RELATED WORKS

Notations and Definitions

A graph is an undirected graph, denoted as $G = (V,E)$, where nodes V are s from the dictionary *fhgh=1:H* and edges $E = f(h, h`)g$ are obtained from co-occurrence relations between s in the explicit relationship. The edge $e_{hh`}$ is weighted based on the association weight between h and h`.

Removing of non-english character

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Research Article

COMPARATIVE STUDY ON ANTIMICROBIAL ACTIVITY OF SEAWEEDS

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Received: 28 June 2017, Revised and Accepted: 13 September 2017

ABSTRACT

Objective: Secondary metabolites from natural resources are a potential source of antimicrobial leads and drugs can exploited to combat antimicrobial resistance in microorganisms. Seaweeds are considered as a valuable source with a broad spectrum of biological activities. Hence, this study was undertaken to screen seaweeds from Mandapam coastal waters, East coast of India, for antimicrobial activity.

Methods: Compounds were extracted using methanol from the seaweeds, namely, *Halimeda gracilis, Caulerpa serrulata, Sargassum swartzii, Sargassum wightii, Jania rubens, Ulva lactuca, Ulva fasciata, Gracilaria corticata, Stoechospermum marginatum, Caulerpa scalpelliformis, Caulerpa taxifolia, Chaetomorpha crassa, Enteromorpha flexuosa,* and *Turbinaria ornate.* The extracts were screened for their antimicrobial activity against selected bacterial and fungal pathogens.

Results: In the present study, *S. swartzii, J. rubens,* and *S. marginatum* showed broad spectrum of antibacterial activity against all the test bacterial pathogens. Among these, the maximum activity was exhibited by *S. swartzii* against *Enterococcus faecalis* (27.00 ± 0.88) and *Streptococcus pyogenes* (23.00 ± 0.84), followed by *J. rubens* against *E. faecalis* (26.00 ± 0.56) and *S. pyogenes* (22.00 ± 0.75), and *S. marginatum* exhibited significant inhibition against *Staphylococcus aureus* (15.00 ± 0.22) and *S. pyogenes* (18.00 ± 1.16).

Conclusion: These seaweeds with significant antibacterial activity will subjected to phytochemical screening to find out the potential active principle responsible for antimicrobial activity. It is followed by purification and characterization of the compounds for possible application in drug formulation, can take this to large-scale application in pharmaceutical industries.

Keywords: Seaweeds, Methanol, Antimicrobial, Secondary metabolites, *Sargassum swartzii, Stoechospermum marginatum, Jania rubens, Enterococcus faecalis.*

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UNAFFECTED SERIAL PROPHECY BASED FILTER TECHNIQUE (USP-FT) FOR NOISE REMOVAL IN FACIAL EXPRESSION RECOGNITION IMAGES

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ABSTRACT

Facial expression recognition is one of the key research area in the field of computer vision. Preprocessing the image is the first step while performing color facial expression images. This research work aims in design and development of unaffected serial prophecy based filter technique for noise removal in facial expression recognition images. Peak signal to noise ratio (PSNR), mean square error (MSE) and structural similarity index measure (SSIM) are the performance metrics and the proposed USP – FT is compared with MHFC [14] method and the results portrays that our method performs better.

Man In India, 97 (4) : 55-60

PERSPECTIVES ON EDUCATIONAL DATA MINING: A STUDY

K.G. Nandha Kumar* and A. Jayanthila Devi**

Abstract: Data mining techniques are applied in ample number of fields in the recent decades. Education is one of the domains where the data mining could be applied effectively. The core tasks are classification, clustering and extraction of association rules. These could be carried out with appropriate educational data. From conventional to evolutional scenario, data mining algorithms, methods, models and techniques are vast. Identifying a particular algorithm for a specific task is important and it is comparatively difficult. This paper represents some well formed methods and techniques of data analysis for education domain. Exploitation of educational data and various kinds of applications are discussed here. In educational data mining, most of the research works are concerned only with predictive analysis and models. There are scopes for other types of researches too. This paper indicates some untouched areas within the educational domain and also discusses some directions to the future research.

Keywords: Data Mining, Education, Assessment, Prediction, Methods and Models.

INTRODUCTION

Data mining techniques are applied in ample number of fields in the recent decades. Particularly in the educational domain, these techniques could be applied to build different kind of phenomena. Data mining is a field of research which has three edges, namely classification, clustering, and rules mining. Data classification is a fundamental task in data mining and analytics field. It classifies the data through predefined data labels. Examples and labels are given before the start of mining process. Hence, it is a supervised method. Data clustering is used to classify raw data, where there are no predefined labels. Labels are given after the end of mining process. Hence it is an unsupervised method. The third task is entirely different

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JMES

Preparation and characterization of Groundnut shell activated carbon as an efficient adsorbent for the removal of Methylene blue dye from aqueous solution with microbiostatic activity

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Keywords

- ✓ Biomaterial;
- ✓ Carbon material;
- ✓ Surface;
- ✓ Texture;
- ✓ Adsorbent;
- ✓ Microbiostatic

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Abstract

This study describes about the preparation of low-cost and eco-friendly groundnut shell activated carbon (GSAC) by combined physical- and chemical-activation in a laboratory-scale facility. The fluorescent emission scanning electron microscope analysis exhibited well-defined pore formation and the energy dispersive X-ray analysis showed elemental composition of GSAC which is essential for the strong adsorption of the dye molecule. This study significantly emphasizes that GSAC would be the effective adsorbent to remove Methylene blue dye from aqueous solution that accompanied with significant microbiostatic activity. Utilization of groundnut shells serves dual purpose of simultaneous waste eradication, as well as cost-effective pollution treatment process.

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Research Article

IDENTIFICATION OF BIOACTIVE COMPOUNDS BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF *SYZYGIUM JAMBOS* (L.) COLLECTED FROM WESTERN GHATS REGION COIMBATORE, TAMIL NADU

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ABSTRACT

Objective: The aim of this study was to investigate the presence of bioactive compounds in the methanolic leaf extract of *Syzygium jambos*.

Methods: Collected leaves were shade dried and made into fine powder, extracted with methanol, and the methanolic extract was prepared and analyzed for the presence of bioactive compounds by gas chromatography-mass spectrometry (GC-MS). The mass spectrum of the chromatography was matched with NIST and WILEY Libraries.

Results: The GC-MS analysis revealed the presence of 45 active compounds in the extract. From the GC-MS investigation, 1-Deoxy-d-mannitol 3-methyl-2-methylsulfanyl-5-nitro-6-pyridin-4-ylpyrimidin-4-one, 3-Pentadecylphenol, 2-biphenylene carboxylic acid, Quinoline-3-carboxylic acid, and Stigmast-5-en-3-ol are important phytoconstituents which have antipyretic and antiparasitic activities.

Conclusion: The present investigation revealed preliminary information on phytocompounds presented in *S. jambos* leaf extract which is very useful for the human community.

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Synergistic effect between Gum Exudates of *Eucalyptus globles* and 2,6-diphenyl-3-methylpiperidin-4-one on Corrosion Inhibition of MS in 1N HCl

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ABSTRACT

Gum exudates of *Eucalyptus globles* (GEG) was identified as green inhibitor for MS dissolution in 1N HCl using gravimetric method at 303-323K. Efficiency of GEG was synergistically increased with addition of 2,6-diphenyl-3methyl-piperidin-4-one (3MDPP). The binary combination of GEG and 3MDPP shows maximum inhibition potency and their S_g value is >1 indicating that synergism exists between GEG and 3MDPP. Mechanism of inhibition of inhibitors on MS is physisorption and it obeys Langmuir's isotherm. Polarization and impedance measurements confirm that inhibitors act as mixed type.

Keywords: 3MDPP, GEG, Binary mixture, Mild steel, Synergism.

INTRODUCTION

In many industries corrosion is a major problem for materials during acid pickling or chemical cleaning. Recently plant gum exudates are found to be non-toxic green corrosion inhibitors for various metals in different media due to its good adhesive and polymeric nature[1-13]. These exudates protect the metal surfaces by adsorption through physical or chemical bonding. But inhibition performance and stability of these gum exudates are found to be less

A thorough survey of literature reveals that, no work has so far been done on the influence of organic compounds as synergist for corrosion inhibition behavior of plant gum exudates and also their stability. So the present work aims to study the corrosion inhibition properties of gum exudates of *Eucalyptus globles* (GEG) towards the corrosion of MS in 1N HCl at 303-323K for 1 h, immersion period. At higher temperature the stability and efficiency of GEG was enhanced by addition of external synergist (3MDPP). In acidic medium, 3MDPP act as very

A Study on Various Cyber-Attacks and their Classification in UAV Assisted Vehicular Ad-Hoc Networks

Authors | Authors and affiliations

N. Vanitha, G. Padmavathi

Conference paper
First Online: 11 September 2018

Part of the Communications in Computer and Information Science book series (CCIS, volume 844)

Abstract

Unmanned Aerial Vehicles (UAV) systems are autonomous systems that can fly separately or it can be functioned remotely without carrying any individuals. These networks prone to various attacks. The people are benefitted from the current growth of networking and cyber world; however, the rapid development of cyber world has furthermore contributed to immoral practices by persons who are using the technology to utilize others. That type of utilization of cyber world with the intension of accessing unauthorized or protected information, collapsing networks, spying, data and currency theft is called as cyber-attack. There is a tremendous

Electrochemical Investigation of Eco-friendly Chitosan Schiff base for Corrosion Inhibition of Mild Steel in Acid Medium

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https://doi.org/10.1016/j.matpr.2018.06.022

Abstract

The corrosion behaviour of mild steel in 1M HCl for the inhibiting action of various concentrations of Chitosan Schiff base was studied using the electrochemical polarization and impedance techniques. The electrochemical studies were carried out in naturally aerated 1M HCl solution containing inhibitors in different concentrations at various temperatures. The data obtained from both the techniques showed that the efficiency of the inhibitor

Study of structural, morphological, optical and biomedical properties of pH based ZnO nanostructures

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Abstract

Nano ZnO has been synthesized at different pH values using chemical precipitation technique. The X-ray diffraction pattern shows the hexagonal wurtzite phase of ZnO nanoparticles. The crystallite size is found to decrease with increasing the pH value. From FE-SEM analysis, it can understand with increasing the pH value from 8 to 12, the morphology of ZnO nanoparticles

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Production, Purification & Analysis of Enterotoxins from HA-MRSA Isolated from Clinical Samples

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Received: 02nd November 2018, Accepted: 28th November 2018, Published: 31st December 2018

Abstract

The problem of resistance is increasing for all types of bacterial isolates including *Staphylococci.* Methicillin resistant *Staphylococcus aureus* (MRSA) has emerged as an important hospital acquired and community acquired pathogen. Multi drug resistance among MRSA is a serious issue limiting the treatment options for the victims. MRSA strains that share the presence of staphylococcus cassette chromosome mec (SCC mec) in their genomes are frequently virulent and predominantly cause infections. Staphylococcal enterotoxins are a family of structurally related proteins that are produced by *Staphylococcus aureus* playing a major role in the pathogenicity. These microbial superantigens have profound effects on the immune system, which makes them useful tools for understanding its mechanism of action. The proposed study is mainly focused on collection of MRSA strains from clinical samples, isolation and Identification was done on the basis of microscopic examination and cultural characteristics, biochemical tests. The cultures were subjected for DNA extraction fallowed by AGE. All the samples were amplified targeting the gene Mec A and sent for sequencing. All the sequences were further analyzed and confirmed. The production and purification of Enterotoxins by MRSA was done and crude protein was collected. This was further purified by downstream processing. The sample was subjected for centrifugation followed by salt precipitation, Dialysis. The enterotoxins were produced form all the strains isolated and purified.

Keywords

MRSA, mec-A Gene, AGE, PCR, Enterotoxin

Introduction

Staphylococcus aureus is a critical human pathogen that can cause an assortment of illnesses, including skin and delicate tissue contaminations and orderly life undermine diseases. The proceeding with rise of methicillin resistant

Effects of multiple slip on MHD combined convective flow of viscoelastic nanofluid over a stretchy sheet with heat absorption

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+ Article information

Abstract

We explore the impact of MHD combined convective flow of viscoelastic nanofluid over a stretchy sheet with heat absorption & multiple slip conditions. The similarity variables are employed to convert the PDE's into dimensionless ODE's and they are solved using homotopy analysis method (HAM). The impact of governing parameters on the velocity, temperature & nanoparticle concentration are analyzed with the help of tables and graphs.

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Psidium guajava leaf extract-mediated synthesis of ZnO nanoparticles under different processing parameters for hydrophobic and antibacterial finishing over cotton fabrics

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ARTICLE INFO

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Psidium guajava
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Photocatalytic activity
Antibacterial activity
Hydrophobic coating

ABSTRACT

In recent times, treatment of natural fibres, like cotton, with antimicrobial finishing using nanoparticles has become increasingly high due to the possibility of anticipated property and their tuneable nature. In this study, using the phytoconstituents of leaf extract of *Psidium guajava*, Zinc acetate was reduced to obtain ZnO nanoparticles using three different synthesis routes namely sonication, wet-chemical and hydrothermal methods. To evaluate and get a broader understanding about the influence of processing parameter over the ZnO nanoparticles, physico-chemical, biological and photocatalytic property, a comparative assessment was performed. The ZnO nanoparticles were subjected to X-ray diffraction, particle size analysis and scanning electron microscope to ascertain its structure/morphology. The comparative studies reveal that hydrothermal method of ZnO synthesis yields smaller particle size (12 nm), with higher photocatalytic activity (94%), higher antibacterial activity against *Escherichia coli* (27.4 mm) and *Staphylococcus aureus* (29.3 mm) and lower structural defects comparing to ZnO synthesised via other methods of synthesis. Furthermore, the most effective ZnO nanoparticles (hydothermal method) was incorporated in chitosan and coated over the cotton fabric to functionalise cotton fabrics for better antimicrobial and water repellent property. Along with the same line, the ZnO nanocomposite coated fabrics exhibit better hydrophobic (157 ± 0.1°) (superhydrophobicity) and higher antibacterial activity (30.58 ± 0.3 mm (99%) (*S. aureus*) and 24 ± 0.5 mm (96%) (*E. coli*)), which could be attributed to ZnO particle size and favourable structural morphology. Thus, the study not only reveals the tuneable nature of the ZnO nanoparticles with respect to processing parameters and also shows the potential role in coating these nanoparticles over the cotton fabrics to impart an effective antimicrobial and hydrophobic finishing for biomedical applications.

1. Introduction

Materials controlled to nano regime (i.e., particle size less than 100 nm) shows atom like behaviour due to the high surface to volume ratio and quantum size effect [1–3], leading to a critical and unique role in array of fields such as biomedical engineering [4,5], tissue re-

cotton fabrics, is responsible for the growth of microbes such as *Staphylococcus aureus* (*S. aureus*) and *Staphylococcus epidermis* (*S. epidermis*) which in turn, leads to skin infections such as boils, impetigo, cellulitis, and furuncles [11,13,14]. Along with the aforementioned fact, the growth of the microorganisms over the textile materials usher leads to discoloration and reduction in textile efficiency [10]. The meteoritic

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Enhancing the thermophysical and tribological performance of gear oil using Ni-promoted ultrathin MoS_2 nanocomposites

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ARTICLE INFO

Keywords:
Ni-MoS_2 nanosheets
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Antiwear

ABSTRACT

This paper presents the enhancement of thermophysical and tribological properties of oil soluble Ni-promoted ultrathin MoS_2 nanocomposites blended with gear oil (SAE 75 W). The Ni-promoted ultrathin MoS_2 namely Ni-MoS_2 nanosheets was exfoliated chemically using ultrasonication and simple reflux techniques. The as-synthesized additives blended with gear oil (i.e., 0.5 wt% of micro MoS_2, MoS_2 nanosheets and Ni-MoS_2 nanosheets) were tested for their thermophysical and tribological properties by using four ball wear tester according to ASTM D2783 standard. The obtained thermophysical and tribological characteristics reveals that the synergetic interaction of Ni and MoS_2 nanosheets have better dispersibility and more suitable lubricant additive for extreme pressure region. Thus, the above research enriches the tribological phenomena of transmission elements in the mechanical industry.

1. Introduction

The most important key challenge in modern automotive developments is the enhancement of friction power losses [1]. Gears or cogwheels are important machine elements which contribute to transmission of motion by means of engaging teeth [2]. Automotive gearboxes expected to perform heavy loads at high speeds and harsh conditions, undergo frictional damages and surface failures [3]. In order to prevent these failures, high performance lubricants are needed to improve the efficiency and durability of tribological components operating under extreme pressure conditions. Lubrication is an effective way to reduce the frictional power losses preventing the gear against wear [4].

Nowadays, smart lubricants consist of base oil blend with special additive packages to protect and control the gear against friction and wear under conditions like extreme pressure and temperature [5]. The use of nanomaterials as a lubricant additive in tribology management is widely explored in recent years due to their small size and large surface material used in modern automotives due to its unique physico-chemical properties [10–12]. The excellent solid lubricating property of MoS_2 contributes to very low sliding friction under extreme pressure and temperature [13]. The 2H hexagonal lamellar layer arrangements with strong S-Mo-S sandwiched structure (Mo atom sandwiched between two layers of closely packed S atoms) make more stable lubricating film between the frictional pairs [14,15]. Moreover, a strong covalent and weak Vander Waals forces between the atomic bonds and molecular layers confirm its superior tribological characteristics [16].

Over the past few decades, different nanostructured additives like Inorganic Fullerene (IF) nanoparticles, nanosheets, nanoflowers, nanorods and nanotubes are widely developed to investigate the lubricant performance of MoS_2 [17]. The study on the behaviour of IF-MoS_2 nanoparticles for ultra-low friction between tribo-interfaces revealed reduction of coefficient of friction (μ) from 0.12 to 0.06 in case of base oil containing IF-MoS_2 nanoparticles [18]. The study of IF-MoS_2 nanoparticles shows an excellent friction and exceptional antiwear (AW)

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Structural, optical and electrical properties of ZnO-ZnS nanocomposites prepared by simple hydrothermal method

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ZnO-ZnS nanocomposites
Band gap
Vibrational stretching
Dielectric properties
Photoconductivity

ABSTRACT

ZnO-ZnS nanocomposites with different molar ratio 25:75, 50:50 and 75:25 percentages were prepared by the simple hydrothermal method. The techniques used for the characterization of samples were X-ray diffractometry (XRD), scanning electron microscopy (SEM), energy dispersive X-ray (EDX) analysis, UV –visible diffuse reflectance spectrometry (DRS), Fourier transformed infrared (FT-IR) spectroscopy, dielectric and photoconductivity measurements. XRD patterns confirmed the crystalline nature of ZnO-ZnS nanocomposites. The calculated average crystallite size using Debye Scherrer's equation is in the range of 48–45 nm and 24-21 nm for ZnO and ZnS compound respectively. SEM images showed spherical morphology with agglomerated nanoparticles. The energy dispersive X-ray technique is opted for elemental mapping of ZnO-ZnS nanocomposite. Optical studies of UV-DRS reveal the band gap to be 2.07–2.11 eV. The FT-IR spectra confirmed stretching vibrations of ZnO and ZnS respectively. Dielectric properties like dielectric loss, dielectric constant and AC conductivity were studied. The photoconductivity measurement exhibits good photo response behavior in the nanocomposite materials.

1. Introduction

Recently, semiconductor nanomaterials/nanocomposites have recognized extensive scope in multidisciplinary areas such as sensor materials, electrochemical, magneto-optical, bio-medical and photo-catalytic activity than that of their same bulk materials due to their unique morphology, size and surface effects [1–5]. Also, the use of semiconductor nanomaterials/nanocomposites in band gap semiconductor nanomaterials have attracted extensive attention due to their size-dependent properties and essential technological applications [20–22]. Among the metal oxides, nanostructured ZnO and ZnS are alluring materials due to their unique properties such as high surface area to volume ratio and energy band gap. ZnS is a wide direct band gap material (3.54 eV zinc blende and 3.91 eV wurtzite) and it is a non-toxic semiconductor which can be observed naturally in two phases [23–26].

Article

HET

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Occupational exposure to photocopiers and their toners cause genotoxicity

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Abstract

Photocopier machines are inevitable office equipment, but they are also sources of air pollution. Millions of people across the world are involved in the operation and maintenance of photocopiers. We aimed to evaluate the potential genotoxic effects of exposure to photocopiers in photocopier operators and maintenance personnel by Comet assay. This study involved 50 photocopier operators, 61 maintenance personnel and 52 controls. Both the photocopier exposed groups exhibited significantly increased DNA damage when compared to controls. Cumulative exposure to photocopiers was the most significant contributor for genotoxicity ($p < 0.001$). Genotoxicity among photocopier maintenance personnel may be due to the presence of carbon black, iron, silicon, magnetite and the high levels of other elements in the photocopier toners. Genotoxicity among photocopier operators might be due to exposure to high levels of particulate matter and volatile organic compounds emitted by photocopiers during operation. Research is essential to improve toner manufacturing processes and chemical composition of toners to reduce genotoxicity. Clean technologies are the need of the day to cut down on particulate matter and volatile organic compound emissions from photocopiers.

Keywords

Photocopier, genotoxicity, toner, occupational exposure, maintenance personnel

Introduction

Photocopier machines are inevitable office equipment in recent days of automation. Millions of workers earn a living through the photocopier industry across the world. The process of photocopying has also undergone a quantum shift in terms of technology, ease of operation, raw materials, output and versatility.[1] The changing landscape of technology has also fuelled the printing machinery and supplies industry with new products and innovation giving the market a significant boost.[2]

Despite the advantages and commercial benefits of on a host of poorly understood factors such as photocopier's model, cartridge age, toner, electrostatic discharge, printer age, fuser temperature, page coverage, paper type, mode of operation, printing frequency and maintenance cycles.[11–12,16–17] A range of other materials in photocopy centres, such as presence of printed documents, cleaning solvent, office furniture, building materials, flooring materials and other office equipment may also influence the emissions.[6]

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Light trapping and power conversion efficiency of P3HT : nano Si hybrid solar cells

Murugan Vinoth,[a] Sundaramoorthy Arunmetha,[a] Mathu Sridharpanday,[a] Subramani Karthik[a] and Venkatachalam Rajendran *[ab]

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In this study, the hybrid solar cells (HSCs) were fabricated with high-purity nano Si from nano SiO_2 precursor extracted from natural minerals, that is, quartz sand. The prepared nano Si was used as an electron transport material to prepare an active layer material mixture with poly(3-hexylthiophene) (P3HT) by mixing it in two composition ratios, namely 1 : 1 and 1 : 0.8. The blended active layer solutions (ALSs) were prepared by using solvents such as 1,2-dichlorobenzene (DCB), chlorobenzene (CB), and chloroform (CF). The HSCs were fabricated using six blended ALSs, namely ALS1, ALS2, ALS3, ALS4, ALS5, and ALS6. The current density–voltage characteristics of the fabricated HSCs were studied using a simulated AM 1.5G illumination having light density power of 100 mW cm^{-2}. The characterization properties such as short circuit current density (J_{sc}) and power conversion efficiency (PCE) were studied and compared with those of all six HSCs fabricated with six blended ALSs. At the outset, the P3HT : nano-Si (1 : 0.8) blended ALS in CB solvent shows 2.37% PCE, and 46% of external quantum efficiency (EQE) absorption which is higher than the other fabricated solar cells. This study discusses the possibilities of preparation of nano Si from natural mineral sand, as an effective electron transport material to fabricate HSCs with enhanced PCE.

Introduction

Silicon solar cells are currently dominating the photovoltaic (PV) market, due to their high-power conversion efficiency (PCE), excellent charge transport properties, high purity, and environmental stability. Currently, the methods used to manufacture high-efficiency silicon wafer solar cells are expensive in terms of material preparation and fabrication. The possible alternative method to the fabrication of silicon wafer solar cells is bulk heterojunction (BHJ) polymer solar cells.[1,2] Recently, preparation of bulk BHJ photovoltaic devices by different solutions has been reported using p-type conjugated polymers, in combination with n-type polymers[3] or fullerenes.[4] The main drawbacks of BHJ polymer solar cells are high hole mobility and low electron mobility. The intrinsic imbalances in carrier mobility and thermal stability present in BHJ polymer solar cells are overcome through HSCs based on a combination of polymer/organic/inorganic/nanocrystal (NC) materials.[5–8] layer is formed by the direct interfacial connection between organic materials, such as small molecules and conducting polymers, and inorganic semiconductors such as Nc Si, TiO_2, ZnO, PbS, CdSe, and CdS, as a nanostructured bilayered configuration.[9–16] The inorganic electron acceptor material can provide more advantages to the system while maintaining a low fabrication cost and high electron mobility.

Although many studies devoted to applications of semiconductor nanocrystals in solar cells have been published,[15–17] the improvement in the surface modification procedure and shell composition enhances the functionalities, such as charge transport and electron mobilities, of the solar cells. The physical origin of the impact of the surface modification procedure on charge separation, electron and hole mobilities process is still limited in BHJ solar cells. However, such an analysis provides a deeper insight into the elementary process occurring in the hybrid blends and, therefore, promotes the development of strategies to improve the PCE of an HSC.

Bioaccumulation of Transition Metal Oxide Nanoparticles and Their Influence on Early Growth Stages of *Vigna unguiculata* Seeds

R. Suriyaprabha, K. A. Sreeja, M. Prabu, P. Prabu & V. Rajendran

BioNanoScience **8**, 752–760 (2018) | Cite this article

269 Accesses | **4** Citations | Metrics

Abstract

A reasonable understanding of the impact and health risk of the metal oxide nanoparticles treated on edible plants is necessary in order to use nanomaterials in food and medicine. In this study, we investigate the uptake and toxic response of transition metal oxides, namely Fe_2O_3, CuO and ZnO nanoparticles synthesised by co-precipitation method using nitrate salts of the respective metals as precursors. The characterisation of all the prepared nanoparticles shows the purity above 97% with rod-like morphology. Cowpea (*Vigna unguiculata*) seeds are soaked in a monodispersed solution of nanoparticles and kept for seed germination and plant growth. Transport and accumulation of the nanoparticles treated in the seeds are assessed through X-ray fluorescence spectroscopy which confirms the uptake of the nanoparticles with

Influence of solvents on the changes in structure, purity, and in vitro characteristics of green-synthesized ZnO nanoparticles from *Costus igneus*

G. Nandhini[1] · R. Suriyaprabha[1] · W. Maria Sheela Pauline[1] · V. Rajendran[1,2] · Wilhelm Karl Aicher[3] · Oscar Komla Awitor[4]

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Abstract
The present study is intended to produce high-purity zinc oxide nanoparticles from the leaves of *Costus igneus* and zinc acetate precursor via sustainable methods by the tribulation with three different solvents (hot water, methanol, and acetone) for the extraction of plant compounds. While examining the physico-chemical characteristics of ZnO nanoparticles incurred by the catalysis of plant bioactive compounds extracted from different solvents, the hot water extract-based green synthesis process yields higher purity (99.89%) and smaller particle size (94 nm) than other solvents. The optimization of the solvents used for the green synthesis of nanoparticles renders key identification in appropriate extraction of bioactive compounds suitable for the nucleation/production of nanoparticles in addition to annealing temperature. The impregnable usage of ZnO nanoparticles in clinical applications is further confirmed based on the treatment of particles (1–10 mg ml^{-1}) against Gram-positive (*S. aureus* and *S. epidermis*) and Gram-negative bacteria (*E. coli* and *K. pneumoniae*) with respect to their growth inhibition. An in-force growth inhibition against particular *S. aureus* and *S. epidermis* imparted by the low concentration of ZnO nanoparticles signifies the utilization and consumption of green-synthesized high-purity nanoparticles for therapeutic and cosmetic applications.

Keywords ZnO nanoparticles · Green synthesis · *Costus igneus* · Solvent extraction · In vitro

Introduction

Green and sustainable synthesis of nanoparticles from plants is nowadays gaining momentum due to the abundance and diversity of plant sources, cost-effectiveness, biocompatibility, and environment-friendly approaches (Salam et al. 2014; Agarwal et al. 2017). In fact, plant-mediated nanoparticles' synthesis avoids the use of sophisticated equipment, large space, and extreme processing conditions. Phytochemical components of the plants play a vital role in synthesizing nanoparticles of interest from their respective precursors. Numerous projects are dedicated to green synthesis of metal oxide nanoparticles for different applications from different vegetable sources of the plant (Iravani 2011; Makarov et al. 2014; Silva et al. 2015). However, the productivity, purity, and structure of such nanoparticles synthesized varies from plant to plant and also parts to parts of the same plant. The extract of the plants is known to be rich in organic/inorganic constituents that act as effective chelating agents for nanoparticles' synthesis. The above constituents play a major role either as reducing or capping/stabilizing agent.

Green synthesis of zinc oxide (ZnO) nanoparticles (NPs) from plants is one of the emerging interests to develop potent nanostructured biomaterials (Ramesh et al. 2015; Nagajyothi et al. 2013; Yuvakkumar et al. 2014; Mirzaei and Darroudi 2017). ZnO NPs reveal excellent

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Semiconducting metal oxides for gas sensor applications

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Abstract The present paper reports the synthesis of the semiconducting metal oxides of tin, copper and zinc via a facile hydrothermal route. By the X-ray diffraction technique the as-synthesized materials are investigated and its crystal properties are characterized.The AC conductivity of the metal oxides are determined in the ambient and cigarette smoke environment. The results show, besides the conventional method of testing the sensitivity of the metal oxides, the dielectric analysis is a versatile method for determining potentially suitable candidates for sensing applications.

1 Introduction

The essence of nanoscience and nanotechnology is to understand, fabricate and engineer materials and devices in the nanometer regime which is considered an enabling technology by which existing materials can acquire different properties rendering them suitable for numerous novel applications varying from structural to functional [1–3]. The research of such nanomaterials have broadened vastly encompassing a variety of systems including one-dimensional, two-dimensional, three-dimensional and amorphous materials made of distinctly dissimilar components and mixed at nanometer scale [4–6]. They have also encompassed matrix of nanoparticles of two or more elements or compounds, having increasing structural sophistication with enhanced properties, triggering interests among researchers over the globe. The field is escalating, with the ability to tailor nanosized materials of heterogeneous chemical species into applications which show potential and promise as it covers multidisciplinary areas of research such as gas sensors [4, 7–10], photocatalysis [8–14], lithium ion batteries [15–17], antibacterial activity [4, 18–20], drug delivery [21], aerospace [22], supercapacitors [23–25], coatings [26, 27] and many more.

Metal oxides constitute a diverse and fascinating class of materials whose properties cover the entire range from metals to semiconductors and insulators. Considering some of the reasons that make oxides of technological interest, is that they determine in large measure what properties are studied [28]. Metal oxides are currently being exploited and enhanced in many ways so as to improve their efficiency and thereby improve their role in the areas of Physics, Chemistry and Material science. The increasing use of metal oxides by incorporating them into a range of products has amplified the pressing need to gather more information about these materials, thereby attracting researchers and making them plunge deeper into their properties and obtain results, which would be the key factors for designing and interpreting this form of nanoparticles [29–32].

Metal oxides exhibit a range of electrical transport properties, from metallic to insulating to superconducting. The introduction of point defects generally affects all types of electrical transport. The increase in conductivity requires acceptors near the valence band. Many defect-rich oxide

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Papain Loaded Solid Lipid Nanoparticles for Colorectal Cancer Therapy

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Authors: Chandran, Suriyakala P.; Nachinmuthu, Kannika P.; Natarajan, Satheesh B.; Inamdar, Mohammad G.; Shahimi, Masliza S.B.M.

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Abstract | References | Citations | Supplementary Data

Background: Colorectal cancer (CRC) also known as bowl cancer is still one of the leading causes of cancer related mortality worldwide. Generally tumor cells are protecting themselves by fibrin coat and it is resistant to fibrinolytic degradation. Such a coated tumor appears as 'self' to the immune system, and thus is not detected as a tumor by the immune system (i.e. natural killer cells). Hence, a potent proteolytic enzyme has to propose/ identify to dissolve the protective fibrin layer, exposing the tumor cell surface to chemotherapy and immune attack. In this research papain was considered to be the potential proteolytic agent, can break down the fibrin coat of cancer cell wall and ultimately the cancer cells are exposed to immune attack and help against the cancer. Secondly, the cytotoxic compound(s) directly deliver to cancer site without harm to normal cells.

Methods: The attempt made to attain this objective, we were designed to fabricate the Papain loaded solid lipid nanoparticles (SLN) by melt dispersion-ultrasonication technique, and investigate the various formulation parameters. The papain loaded SLN was characterized by particle size analysis, zeta potential analysis, differential scanning calorimetry (DSC), Scanning electron microscopy (SEM), drug encapsulation efficiency, in vitro drug release, and in vitro cytotoxicity studies on HT-29 colorectal cancer cells.

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Original Research Article

Microbiology

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PREVALENCE OF METHICILLIN RESISTANT *STAPHYLOCOCCUS AUREUS* IN WESTERN TAMILNADU

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ABSTRACT

Humans are natural reservoir for *Staphylococcus aureus*, and asymptomatic colonization is far more common than infection. Colonization by*Staph.aureus*may be persistent and can last for years. Recent reports of strains of Methicillin Resistant *Staphylococcus aureus* (MRSA) isolated from community have led speculation that the epidemiology of *S. aureus* is changing .Usually, MRSA infections havebeen a concern among hospitals for decades now and the reports revealthat the community acquired MRSA is increasing . The community acquired strains could possibly have arisen as a consequence of resistance gene transfer from a hospital acquired (nosocomial) donor into a susceptible recipient. With appropriate analysis of donor andrecipient chromosomes, it could be possible to determine whether these newly identified communityacquired strains are wild or self-supporting.The present study was conducted with a total sample of 1296 wound and other skin infection samples that were collected from different hospitals in western Tamilnadu. The specimens were inoculated in blood agar for isolation and identified as *S.aureus* by using standard method based on colony morphology, Gram's stain, catalase and coagulase test. A total 258 isolates were confirmed as S.aureus. These strains were processed by the following three techniques,(i) oxacillin, Methicillin and cefoxition disk

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Review article

Pharmacological benefits of neferine - A comprehensive review

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ARTICLE INFO

Keywords:
Neferine
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Lotus
Chemo-resistance
Cisplatin

ABSTRACT

This article recapitulates the existing *in vitro* and *in vivo* studies focusing on the effects of neferine-an alkaloid derivative of lotus plant, in various disease models and its effects on key signaling molecules. The review also compiles a large number of research studies that demonstrate methods for isolation and extraction, biosynthetic pathway, pharmacological activity and mode of action of neferine and their underlying mechanisms at cellular level. Neferine is a unique bis-benzylisoquinoline alkaloid that possesses a number of therapeutic effects such as anti-cancer, anti-diabetic, anti-aging, anti-microbial, anti-thrombotic, anti-arrhythmic, anti-inflammatory and even anti-HIV. It also enhances the anti-cancer properties of other anti-cancer drugs like cisplatin, adriamycin, taxol, *etc*. It is also reported to reverse chemo-resistance and enhance sensitivity of the cancer cells towards anti-cancer drugs. The underlying mechanisms for its activities mainly include apoptosis, autophagy and G1 arrest. Neferine protects them against the effect of drugs like cisplatin. The therapeutic properties of neferine is widely diverse, while it shows toxicity to cancer it also shows cyto-protective effects against cardio-vascular diseases, pulmonary disease, and is also effective against Alzheimer's disease and elicits anti-oxidative effect in many cellular systems. This article thus is the first ever attempt to review the therapeutic activities of neferine established in *in vitro* and *in vivo* models and to compile all the fragmented data available on the omnipotent activities of neferine.

A personalized recommendation engine for prediction of disorders using big data analytics

Publisher: IEEE Cite This PDF

V. Shobana ; N. Kumar All Authors

2 Paper Citations

352 Full Text Views

Abstract

Document Sections

I. Introduction

II. Personalized Healthcare: A Data-Driven Approach

III. Reccommendations in Health Care

Abstract:
Recommender systems has become an important research field since 1990's and its applications includes several domains. The application of recommendations in health care is a very wide area which recommends the patients about their health. Upon vast amount of data prevailing in health care sector, these data can be processed using big data tools to deliver a meaningful prediction to the patients. The predictions and recommendations will be more accurate since we are dealing with vast amount of data. Moreover it alerts the user from the occurrence of disease and takes necessary actions before it occurs. Thus recommender system along with big data will be promising solution that is prevailing in healthcare sector. The sum total of data related to the patient and their well-being constitutes the "Big Data" problem in the healthcare industry.

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Convection in a sinusoidally heated square enclosure utilizing *Ag – water* nanofluid with heat generating solid body

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ARTICLE INFO

Keywords:
Convection
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ABSTRACT

In this study, natural convection flow in a square enclosure filled with *Ag*–water nanofluid and with a heat conducting solid square body are carried out numerically. A two-dimensional solution for steady laminar incompressible flow is obtained by using the finite volume method based on the control volume approach. The study goes further to investigate the effect of the various thermal boundary conditions on the fluid flow and heat transfer inside the enclosure. The area of the solid body is changed at the centerline of the enclosure. Effect of area ratio of solid-enclosure, the thermal conductivity ratio of solid-fluid, solid volume fraction and temperature difference ratio of solid-fluid are studied. The flow and heat transfer characteristics are expressed in the form of streamlines and isotherms, respectively.

1. Introduction

Fluid flow and heat transfer inside differently heated square enclosures has been studied widely for its various applications in engineering and geophysical systems. Physics involved in the buoyancy-driven flow inside a square domain has relevance to a variety of practical problems such as nuclear and chemical energy production systems, crystal growth in liquids, solar energy collection and convective heat transfer associated with boilers and electronics, etc. The simulation of free convection heat transfer inside enclosure was first numerically examined by Davis [1], which was addressed as the benchmark solution of many enclosure problems. Vierendeels et al. [2] fully solved the Navier–Stokes equations for low speed compressible flows to simulate buoyancy-driven flow inside a square domain without resorting to low Mach number approximation or Boussinesq approximation. The low Mach number stiffness which are kept with temperature difference. Lee and Ha [3] numerically investigated natural convection in a horizontal enclosure with a conducting body. They compared the results of the case of conducting body with those of neutral, isothermal and adiabatic bodies and observed that when the dimensionless thermal conductivity is 0.1, a pattern of fluid flow and isotherms and the corresponding surface- and time-averaged Nusselt numbers are almost the same as the case of an adiabatic body. House et al. [4] analyzed the effect of a square solid heat conducting body on natural convection in a square enclosure and concluded that heat transfer across the enclosure reduced or enhanced by a body with a thermal conductivity ratio greater or less than unity. The geometry considered in the numerical study of Oh et al. [5] was the solid conducting and heat generating body inside the enclosure. With these assumptions, it was observed that the flow was driven by a temperature difference caused by the heat-generating source and a temperature dif-

Research Article

In vivo antiplasmodial evaluation of *syzygium jambos* L. Alston by four day suppressive test

J Devakumar, S S Sudha*

ABSTRACT

Objective: The unexplored region of Western Ghats possesses natural source of noble therapeutic floras for many diseases. The present study was aimed to investigate the *in vivo* antiplasmodial activity of *Syzygium jambos* from Western Ghats. **Methods:** The four extracts acetone, chloroform, methanol and aqueous were explore their antiplasmodial activity by Peter's four day test. **Results:** In Peter's four day test significant parasite suppression 99.24% ($P<0.001$) was observed in Chloroquine (CQ 25mg/kg b.wg.) group prolonging the mean survival time of animals ≥30 days, whereas no average parasitaemia suppression (44.33±0.94) was observed in the negative control group. An effective parasite suppression ($P<0.01$) of 72.93% and 72.18% was identified in methanol and acetone extracts respectively at 600 mg/kg b.wt. The acetone and methanol extracts prolonged the mean survival days of mice groups up to 27.8 ± 0.68 and 26.0 ± 1.29 days respectively. **Conclusion:** Among the four extracts tested methanol and acetone extracts exhibited antimalarial activity. The present study report establishes, *Syzygium jambos* leaf extracts were effective with an assorted range of antiplasmodial activity and could be a potential source in the discovery of antimalarial drug.

KEY WORDS: Antiplasmodial activity, Chloroquine, *Syzygium jambos*, Western Ghats

INTRODUCTION

Among parasitic infections malaria remains serious health problem worldwide. Globally around 3.2 billion peoples are at malarial risk[1] with 2-3 million deaths occurring each year.[2] In Africa, malaria accounts for 10% of the total disease burden and over 90% of deaths

Paramakudi, Thoothukudi, Kanyakumari, Krishnagiri, Dharmapuri, and Thiruvannamalai, where 56.6% of cases are reported from Chennai, 4.4% from other urban malaria scheme towns, and 39% were reported from rural areas.[6] The continuous upsurge in the global prevalence of malaria stemmed from increasing

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OPTIMIZATION OF ALPHA AMYLASE FOR BETTER DOUGH PREPARATION

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ABSTRACT

Amylases have potential application in a wide number of industrial processes such as food, fermentation and pharmaceutical industries. The present study mainly focused on screening of amylase producing *Bacillus subtilis*, production by solid-state fermentation using rice straw and banana pseudo stem and its optimization for amylase activity in dough preparation, effect on bread making and analysis of bread quality. Maximum production of amylase was obtained after 24hrs of incubation. The optimum pH for enzyme activity was found to be at pH 7 and the optimum temperature for the activity was found to be at the range of 30 – 70°C. The combination of 0.8g yeast and 300 U of amylase gave better results than enzyme alone for the better dough preparation.

Keywords: Amylase, *Bacillus subtilis*, solid state fermentation, optimization

INTRODUCTION

The industrial enzyme producers sell enzymes for a wide variety of applications and approximately more than 25% amylases represent as a class of industrial enzymes of the market (**Sidhu *et al.*, 1997; Rao *et al.*, 1998**). Starch digesting amylase has found important application in bioconversion of starches and starch-based substrates (**Fogarty *et al.*, 1983**). Amylolytic enzymes are of great significance in biotechnological applications in food industry, amylases can be synthesized from numerous sources, like plants, animals and microorganisms. The enzymes from microbial sources commonly meet industrial demands and had **Sodhi *et al.*, 2005; Soni *et al.*, 2003**). The present study mainly focused on screening of amylase producing *Bacillus subtilis*, production by solid-state fermentation using rice straw and banana pseudo stem and its optimization for amylase activity in dough preparation, effect on bread making and analysis of bread quality.

MATERIAL AND METHODS

Isolation Of *Bacillus subtilis* from the environment

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Research Article

BIOMIMETIC SYNTHESIS, CHARACTERIZATION AND EVALUATION OF ANTIOXIDANT, ANTIMICROBIAL EFFICACY OF SILVER NANOPARTICLES USING *ANREDERA CORDIFOLIA* LEAF EXTRACT

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Received: 28 December 2016, Revised and Accepted: 19 January 2017

ABSTRACT

Objective: This study is focused on the biosynthesis of silver nanoparticles (AgNPs) using aqueous extract of *Anredera cordifolia* and to investigate the free radical scavenging potential, antimicrobial activity of the nanoparticles against different human pathogens.

Methods: The formation of AgNPs was indicated by the color change from colorless to reddish brown. Biosynthesized AgNPs were characterized using several techniques, *viz.*, ultraviolet (UV)-visible spectroscopy, Fourier transform infrared, X-ray diffraction (XRD), transmission electron microscopy (TEM), scanning electron microscopy (SEM), and energy dispersive X-ray analysis. The free radical scavenging potential was measured by 2, 2-diphenyl-1-picrylhydrazyl (DPPH), ferric reducing antioxidant power (FRAP) assay, antimicrobial activity against six microorganisms was tested using disc diffusion method.

Results: UV-visible spectral analysis showed silver surface plasmon resonance band at 426 nm. The crystalline morphology and size of the nanoparticles were determined by TEM, SEM, and XRD studies which showed the average size of the nanoparticles in the range 40-60 nm. The biologically synthesized nanoparticles efficiently inhibited pathogenic organisms such as *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumonia*, *Pseudomonas aeruginosa*, and *Proteus vulgaris*. The biosynthesized nanoparticles might serve as a potent antioxidant as revealed by DPPH assay and FRAP assay.

Conclusion: The biosynthesis of AgNPs had several advantages in pharmaceutical applications as well as large-scale commercial production.

Keywords: Silver nanoparticle, *Anredera cordifolia* leaf, Scanning electron microscopy, Transmission electron microscopy, X-ray diffraction, Antioxidant, Antimicrobial.

 DOI: http://dx.doi.org/10.22159/ajpcr.2017.v10i4.16819

INTRODUCTION

Nanotechnology can be termed as the synthesis, characterization, exploration, and application of nanosized (1-100 nm) materials for the development of science. The intrinsic properties of metal nanoparticles are determined by size, shape, composition, crystallinity, and morphology. It is a field of science which deals with production, sensors [10]. AgNP-embedded antimicrobial paint [11] is a promising area of ecofriendly applications. Hence, a variety of techniques including physical and chemical methods have been developed to synthesize AgNPs, the physical methods [12] are highly expensive and chemical methods are harmful to the environment [13]. Therefore, there is a growing need to develop environmentally benign nanoparticle synthesis processes that do not use toxic chemicals in the synthesis

Conferences > 2016 IEEE International Confe...

Neighbor node discovery mechanism based delay aware routing protocol (DARP – NND) for cognitive radio ad hoc networks

Publisher: IEEE

Cite This PDF

M. Kannan ; B. Rosiline Jeetha All Authors

Abstract

Document Sections

I. Introduction

II. Related Works

III. Proposed Work

IV. Simulation Settings and Performance Matrics

Abstract:

Cognitive Radio ad hoc network is a sort of wireless network. Cognitive radios have the ability to sense the wireless medium. Routing is the major research area and ensuring quality-of-service (QoS) is a challenging problem. This paper proposes a neighbor node discovery mechanism based delay aware routing protocol in order to provide QoS in such network. Primary QoS metrics such as throughput and delay can be put into consideration for evaluating the performance of the proposed protocol DARP-NND. Simulations are passed out by means of NS2 and the outcomes confirm that the proposed protocol achieves improvement in provisions of increased throughput and reduced delay.

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Research Article

ANTIOXIDANT AND CHEMOTHERAPEUTIC POTENTIAL OF *CURCUMA AMADA* RHIZOME EXTRACT ON BENZO(A)PYRENE INDUCED CERVICAL CARCINOMA IN SPRAGUE DAWLEY RATS

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Received: 09 November 2016, Revised and Accepted: 09 December 2016

ABSTRACT

Objective: To evaluate the antioxidant and chemotherapeutic potential of *Curcuma amada* Rhizome extract on benzo(a)pyrene (BaP) induced cervical carcinoma in Sprague Dawley rats.

Methods: A total of 30 female Sprague Dawley rats were selected to establish cervical cancer model and then divided into 5 groups at random with six mice in each group. Group 1 control, Group 2 BaP (oral), Group 3 BaP for 8 weeks and post-treated with cisplatin (intravenous administration), Group 4 BaP for 8 weeks and post-treated with 250 mg of ethanol extract of *C. amada* (oral), Group 5 BaP for 8 weeks and post-treated with 500 mg of ethanol extract of *C. amada* (oral). 4 weeks after the treatment, the animals were sacrificed, serum separated, and cervical tissues were dissected. Antioxidants and the markers carcinoembryonic antigen (CEA), cancer antigens (CAs) 125, gamma glutamyltransferase (GTT) were assayed in serum and the tissue was used for analyzing tumor burden and sectioned for histopathological assays.10% tissue homogenate was estimated for antioxidants and membrane-bound enzymes.

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A Graph Based Similarity Measure (GBSM) for Finding the Semantic Relation between the Words in Microblogs

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Abstract-

This paper introduce a new graphics model for micro blogs to understand the mostly inference topics. The twitter deals with more than hundred billions of tweets per day, so it is not an easy task to find the recurrent topics. Twitter are the one of the leading social networking site where the people can share their arousing and opinion. The tweets are very petite text, noisy and unstructured. Tweets are constantly screening up with rich user-generated[1]. The constructs the semantic relationships to each other and also provides a way to connect the semantically related and co-occurred word. The proposed method Graph Based Similarity Measure (GBSM) define a

RELATED WORKS

Notations and Definitions

A graph is an undirected graph, denoted as $G = (V,E)$, where nodes V are s from the dictionary $fhgh=1:H$ and edges $E = f(h, h`)g$ are obtained from co-occurrence relations between s in the explicit relationship. The edge $e_{hh`}$ is weighted based on the association weight between h and h`.

Removing of non-english character

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Research Article

COMPARATIVE STUDY ON ANTIMICROBIAL ACTIVITY OF SEAWEEDS

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ABSTRACT

Objective: Secondary metabolites from natural resources are a potential source of antimicrobial leads and drugs can exploited to combat antimicrobial resistance in microorganisms. Seaweeds are considered as a valuable source with a broad spectrum of biological activities. Hence, this study was undertaken to screen seaweeds from Mandapam coastal waters, East coast of India, for antimicrobial activity.

Methods: Compounds were extracted using methanol from the seaweeds, namely, *Halimeda gracilis, Caulerpa serrulata, Sargassum swartzii, Sargassum wightii, Jania rubens, Ulva lactuca, Ulva fasciata, Gracilaria corticata, Stoechospermum marginatum, Caulerpa scalpelliformis, Caulerpa taxifolia, Chaetomorpha crassa, Enteromorpha flexuosa,* and *Turbinaria ornate.* The extracts were screened for their antimicrobial activity against selected bacterial and fungal pathogens.

Results: In the present study, *S. swartzii, J. rubens,* and *S. marginatum* showed broad spectrum of antibacterial activity against all the test bacterial pathogens. Among these, the maximum activity was exhibited by *S. swartzii* against *Enterococcus faecalis* (27.00 ± 0.88) and *Streptococcus pyogenes* (23.00 ± 0.84), followed by *J. rubens* against *E. faecalis* (26.00 ± 0.56) and *S. pyogenes* (22.00 ± 0.75), and *S. marginatum* exhibited significant inhibition against *Staphylococcus aureus* (15.00 ± 0.22) and *S. pyogenes* (18.00 ± 1.16).

Conclusion: These seaweeds with significant antibacterial activity will subjected to phytochemical screening to find out the potential active principle responsible for antimicrobial activity. It is followed by purification and characterization of the compounds for possible application in drug formulation, can take this to large-scale application in pharmaceutical industries.

Keywords: Seaweeds, Methanol, Antimicrobial, Secondary metabolites, *Sargassum swartzii, Stoechospermum marginatum, Jania rubens, Enterococcus faecalis.*

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UNAFFECTED SERIAL PROPHECY BASED FILTER TECHNIQUE (USP-FT) FOR NOISE REMOVAL IN FACIAL EXPRESSION RECOGNITION IMAGES

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ABSTRACT

Facial expression recognition is one of the key research area in the field of computer vision. Preprocessing the image is the first step while performing color facial expression images. This research work aims in design and development of unaffected serial prophecy based filter technique for noise removal in facial expression recognition images. Peak signal to noise ratio (PSNR), mean square error (MSE) and structural similarity index measure (SSIM) are the performance metrics and the proposed USP – FT is compared with MHFC [14] method and the results portrays that our method performs better.

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PERSPECTIVES ON EDUCATIONAL DATA MINING: A STUDY

K.G. Nandha Kumar* and A. Jayanthila Devi**

Abstract: Data mining techniques are applied in ample number of fields in the recent decades. Education is one of the domains where the data mining could be applied effectively. The core tasks are classification, clustering and extraction of association rules. These could be carried out with appropriate educational data. From conventional to evolutional scenario, data mining algorithms, methods, models and techniques are vast. Identifying a particular algorithm for a specific task is important and it is comparatively difficult. This paper represents some well formed methods and techniques of data analysis for education domain. Exploitation of educational data and various kinds of applications are discussed here. In educational data mining, most of the research works are concerned only with predictive analysis and models. There are scopes for other types of researches too. This paper indicates some untouched areas within the educational domain and also discusses some directions to the future research.

Keywords: Data Mining, Education, Assessment, Prediction, Methods and Models.

INTRODUCTION

Data mining techniques are applied in ample number of fields in the recent decades. Particularly in the educational domain, these techniques could be applied to build different kind of phenomena. Data mining is a field of research which has three edges, namely classification, clustering, and rules mining. Data classification is a fundamental task in data mining and analytics field. It classifies the data through predefined data labels. Examples and labels are given before the start of mining process. Hence, it is a supervised method. Data clustering is used to classify raw data, where there are no predefined labels. Labels are given after the end of mining process. Hence it is an unsupervised method. The third task is entirely different

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Preparation and characterization of Groundnut shell activated carbon as an efficient adsorbent for the removal of Methylene blue dye from aqueous solution with microbiostatic activity

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- ✓ Biomaterial;
- ✓ Carbon material;
- ✓ Surface;
- ✓ Texture;
- ✓ Adsorbent;
- ✓ Microbiostatic

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Abstract

This study describes about the preparation of low-cost and eco-friendly groundnut shell activated carbon (GSAC) by combined physical- and chemical-activation in a laboratory-scale facility. The fluorescent emission scanning electron microscope analysis exhibited well-defined pore formation and the energy dispersive X-ray analysis showed elemental composition of GSAC which is essential for the strong adsorption of the dye molecule. This study significantly emphasizes that GSAC would be the effective adsorbent to remove Methylene blue dye from aqueous solution that accompanied with significant microbiostatic activity. Utilization of groundnut shells serves dual purpose of simultaneous waste eradication, as well as cost-effective pollution treatment process.

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Research Article

IDENTIFICATION OF BIOACTIVE COMPOUNDS BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS OF *SYZYGIUM JAMBOS* (L.) COLLECTED FROM WESTERN GHATS REGION COIMBATORE, TAMIL NADU

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ABSTRACT

Objective: The aim of this study was to investigate the presence of bioactive compounds in the methanolic leaf extract of *Syzygium jambos*.

Methods: Collected leaves were shade dried and made into fine powder, extracted with methanol, and the methanolic extract was prepared and analyzed for the presence of bioactive compounds by gas chromatography-mass spectrometry (GC-MS). The mass spectrum of the chromatography was matched with NIST and WILEY Libraries.

Results: The GC-MS analysis revealed the presence of 45 active compounds in the extract. From the GC-MS investigation, 1-Deoxy-d-mannitol 3-methyl-2-methylsulfanyl-5-nitro-6-pyridin-4-ylpyrimidin-4-one, 3-Pentadecylphenol, 2-biphenylene carboxylic acid, Quinoline-3-carboxylic acid, and Stigmast-5-en-3-ol are important phytoconstituents which have antipyretic and antiparasitic activities.

Conclusion: The present investigation revealed preliminary information on phytocompounds presented in *S. jambos* leaf extract which is very useful for the human community.

Effect of chemical reaction and heat generation on 3D double diffusive convection over a stretching plate: Numerical and analytical study

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Abstract. The heat absorption/generation and chemical reaction effects of unsteady flow of a viscous fluid over a stretching plate is analyzed. The governing PDF models are converted into an ODE model with the help of similarity variable and they are solved analytically using the homotopy analysis method (HAM) and numerically by Runge-Kutta fourth order method. The skin-friction coefficient, local Nusselt and local Sherwood numbers are tabulated for various values of the parameters. It is observed that the heat transfer gradient rises on strengthening the heat absorption/generation parameter and it suppresses on escalating the stretching ratio parameter. The mass transfer gradient increases on rising the chemical reaction parameter and it diminishes on rising the unsteady parameter.

Keywords: heat/mass transfer, homotopy analysis method, chemical reaction, heat absorption/generation.

1. Introduction

The heat-mass transfer over a stretching plate is essential in many practical applications in science and engineering. Some applications are hot rolling, glass wire production, glass blowing and fibers spinning, etc. Wang[1] analyzed the 3D flow over a flat surface. Unsteady magneto-hydrodynamic flow in a porous stretching surface was examined by Hayat et al.[2]. They found that the temperature drops on rising the Prandtl number. The heat-mass transfer effects of a viscoelastic fluid was analytically studied by Eswaramoorthi et al. [3]. They found that the heat transfer gradient depresses as enlarging the radiation parameter. Various authors discussed in this problem in different aspects, see ([4]-[7]).

The effect chemical reaction is important in many chemical engineering processes, like, food processing, solar collector, formation and dispersion of fog, etc. Hayat et al.[8] examined the second grade fluid flow with chemical reaction and found that, upgrading the fluid concentration due to raising the chemical reaction parameter. The chemically reacting viscoelastic fluid flow was investigated by Cortell et al.[9]. Few significant analysis in this direction is highlighted in ([10] -[17]).

The aim of this paper is to study the mass and heat transfer of unsteady 3D fluid flow with chemical reaction and heat absorption/generation over a time dependent stretching surface.

Effect of thermal radiation and heat absorption of MHD Casson nanofluid over a stretching surface in a porous medium with convective heat and mass conditions

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Abstract. This article explores the impact of radiation and heat absorption on magneto-convective flow of Casson nanofluid over a stretching surface in a porous medium. The convective heat and mass boundary conditions are also taken into consideration in this study. The governing models are converted into a nonlinear ODE models and they are solved analytically using homotopy analysis method (HAM). The significance of physical parameters on velocity, temperature and nano particle volume fraction are discussed graphically.

Keywords. Casson nanofluid, MHD, thermal radiation, suction/injection, convective heat and mass conditions.

1. Introduction

In heat transfer equipments, the thermal conductivity of a fluid plays a key role. Inherently, conventional heat transfer liquids, like water, oil, etc. have low thermal conductivity. So, many researchers are interested in their studies which aim to increase the thermal conductivity of the ordinary liquids. Nano sized particles are added to ordinary liquids to enhance the thermal conductivity. The liquids with nano particles are termed as nanofluids. The problem of boundary layer flow of a nanofluid with heat source/sink was investigated by Ahmed et al.[1]. Other studies on nanofluid flow in different physical situations are given in the Refs.([2]-[8]). The Casson fluid, introduced by Casson [9], is one of the subclass of non Newtonian fluids which describes a shear thinning case. The viscosity of a Casson fluid is infinity when the stress rate is zero. However, the stress rate raises up to infinity, the viscosity comes down to zero level. Tomato sauce, honey, human blood, etc. are some of the examples. The Casson fluid flow behavior over an exponentially shrinking sheet was studied by Nadeem et al. [10]. Hayat et al. [11] analyzed the Casson nanofluid over a convective heated surface with chemical reaction.

Many engineering and industry problems are highly non-linear and very difficult to solve these problems analytically. HAM is one of the simplest method to solve highly non-linear problems, see ([12]-[16]). The major emphasis of this investigation is to discuss the radiation and heat absorption effects on magneto-convective flow of Casson nanofluid over a stretching surface in a porous medium with convective heat and mass boundary conditions.

Computation of total eccentricity using python program

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Abstract. In this manuscript, we use Python program to compute the total eccentricity of various bridge molecular graph …
Keywords: Bridge molecular; Eccentricity; Python program; Topological index.
Mathematical Subject Classification(2010) : 05C12

1. Introduction

In organic chemistry, topological indices have been found to be useful in chemical documentation, isomer discrimination, structure-property relationships, structure-activity (SAR) relationships and pharmaceutical drug design. These indices include Wiener index [23–28], Balaban's index [2–8], Hosoya index [12,13], Randi´c index [14] and so on. In recent years, some indices have been derived related to eccentricity such as eccentric connectivity index [17, 14, 20], eccentric distance sum [10], augmented and super augmented eccentric connectivity indices [1, 13, 22], adjacent eccentric distance sum index [8,20,21,22].

The total eccentricity of the graph G [6, 8,23,24], denoted by $\zeta(G)$, is defined as the sum of eccentricities of all vertices of graph G, i. e.,

$$\zeta(G) = \Sigma_{v \in V(G)} \varepsilon(v).$$

2. Bridge Molecular Graph[25] :

Let $\{G_i\}_{i=1}^{d}$ be a set of finite molecular graphs with vertices $v_i \in V(G_i)$. The bridge molecular graph $B(G_1, G_2 \ldots G_d, v_1, v_2, \ldots v_d)$ of $\{G_i\}_{i=1}^{d}$ with respect to the vertices $\{v_i\}_{i=1}^{d}$ is yielded from the molecular graphs $G_1, G_2 \ldots G_d$ in which the vertices v_i and v_{i+1} are connected by an edge for i=1,2...d-1.

2.1. Bridge Molecular graph $G_d(C_n, v_1, v_2, \ldots v_d)$[25]:

Let C_n be the cycle with n vertices. Then $G_d(C_n, v_1, v_2, \ldots v_d)$ is a bridge molecular graph in which d copies of C_n are present in such a way that successive C_n 's are connected by an edge.

2.2 Result:

For the bridge molecular graph $G_d(C_4, v_1, v_2, \ldots v_d)$ the total eccentricity index is given by

$$\zeta(G_d(C_4, v_1, v_2, \ldots v_d)) = \left\{ \begin{array}{l} 24d + \sum_{i=1}^{(d-2)/2} 24i, d - even \\ 18d + 2 + \sum_{i=1}^{(d-1)/2} 24i, d - odd \end{array} \right\} \quad d \geq 2$$

where d is number of copies of C_4.The First result is for all even values of 'd' and the second result is for all odd values of 'd'.

Thermal radiation and cross diffusion effects on 3D convective flow of a viscoelastic fluid over a stretchy paper with chemical reaction

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Abstract. Effects of thermal radiation, Dufour and Soret numbers on 3D unsteady flow of a chemically reacting viscoelastic fluid over a stretchy paper with internal heat generation/absorption are investigated. The governing PDE models are transformed into an ODE models with suitable similarity variables and they are solved using homotopy analysis method (HAM). The influences of various parameters are analyzed. The Dufour effect boosted up the mass transfer rate and suppresses the heat transfer rate. The heat transfer rate enhances with Soret number and it diminishes on raising the Dufour number

Keywords Heat transfer, radiation, chemical reaction, viscoelastic fluid, Soret/Dufour effect, heat generation or absorption

1. Introduction

The flow over a stretching surface has a developing area in recent years due to its many industrial applications, like continuous casting, fiber spinning, plastic sheet production, glass blowing, rolling and manufacturing plastic films. Wang [1] studied the 3D flow over a stretching flat surface. Other related analysis in this direction was presented by many authors, see ([2]-[8]). The Dufour and Soret effects are important in some situations. Alam et al. [9] analyzed the MHD flow over a porous plate. Few important studies in this directions are in Refs. ([10]-[18]).

In this paper, we investigate the Soret and Dufour effects on 3D flow of a chemically reacting viscoelastic fluid over a stretchy paper with radiation and heat absorption or generation. The governing equations are non-linear and it is very difficult to solve these nonlinear problems. The homotopy analysis method (HAM) is currently very popular and has been used by many researchers for the solutions of the non-linear problems, see ([19]-[22]). Therefore, the present problem is solved by using this method.

Solving linear programming problem by means of fuzzy Z numbers

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Abstract. Obtaining the result of linear programming problem is an appealing chore. Recently, Z-number has been developed by Zadeh to sculpt fuzzy statistics with the poise degree. Here, a new Multi Criteria Decision Making Matrix (MCDMM) found taking place Z-number be projected towards pact by means of linguistic decision making problems. The decision making problem is then converted to linear programming problem and hence we can find the optimum solution. A mathematical illustration on MCDMM is second-hand to point up the competence of the projected technique.

Keywords: fuzzy set; triangular fuzzy number; Z-number; decision-making; linear programming problem.

1. Introduction

In the true globe, ambiguity is a insidious happening. A large amount of the data taking place which decisions be found be unsure. We have a significant potential to build logical decisions found on data which is unsure, inaccurate as well as/otherwise unfinished. Formalization of this facility, at smallest amount to a little degree, is a brave so as to is rigid to congregate. The majority frequently used method in foundries is a linear programming problem (LPP). In veracity, a firm might fire up a creation process by means of resources i.e. a slightest amount in favour of deal. In due itinerary of instance the firms have to endow a slight extra than the beginning anticipated budget in the attention of his creation process. In this circumstances fuzzy set theory can be second-hand to plan sculpt with the assist of membership functions. In true existence circumstances, a linear programming sculpt involves parameters whose ideals are not famous however assigned by experts. These assigned ideals are not accurate and the decision maker has to contract with doubts so as to describe by firm. Zadeh wished for an idea, specifically Z-number.[2]

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Computation of topological Indices using python program for chemical graph structure

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Abstract. In this paper, we use Python program to compute the First Zagrab Index, Second Zagreb index and F- index of the Circumcoronene series of Benzenoid and Molecular Graph of Triangle Benzenoid [27,29]

Keywords: Benzeneoid ; First Zagrab Index; Second Zagreb index; topological index; Triangular Benzenoid.
Mathematical Subject Classification(2010) : 05C12

1. Introduction

An undirected and connected graph $G= (V, E, F)$ represents the topological structure of a chemical compound, when the set of vertices (or nodes) (V) represents the atoms of the molecule, the set of edges(E) represents the connections among the atoms, and (F) is a function that characterizes the types of edges and vertices. So, when the graph (G) represents the molecular structure of a chemical compound, it is called a molecular graph.[1,2,5,7,12,16-30]

Python language is easy to evaluate the above indices and also to compare one index with another. Python is very easy to write and its running time of the programme is few seconds. In this paper, we use Python program to compute the First Zagrab Index, Second Zagreb index and F- index of the Circumcoronene series of Benzenoid and Molecular Graph of Triangle Benzenoid[24,27,30]. Interested readers can check the program in the web
https://repl.it/@Manimekalai/Sequence2420454inc162,
https://repl.it/@Manimekalai/Sequence24156396inc108,
https://repl.it/@Manimekalai/BenzeneSeries2484201116,
https://repl.it/@Manimekalai/Sequence24204546inc162.

2. The First Zagreb Index [24]:

For any simple, connected graph G, the first Zagreb index of a graph G is defined by
$M_1(G) = \sum_{v\in V(G)} d_G(v)^2$ or $M_1(G) = \sum_{uv\in E(G)} [d_G(u) + d_G(v)]$
where $d_G(v)$ is the degree of vertex v in G.

2.1. *Circumcoronene series of benzenoid[30]*

The circumcoronene series of benzenoid is family of molecular graph, which consist several copy of

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Buoyant convection in porous annulus with discrete sources-sink pairs and internal heat generation

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Abstract. In the present analysis, numerical investigation of buoyancy-driven convective thermal transport in a vertical annulus has been performed when the interior and exterior cylinders are discretely heated and cooled by heat source-sink pair arrangements. The upper and lower boundaries and unheated parts of inner and outer cylinders are insulated. For the porous annulus, the Brinkman-extended Darcy formulation is adopted for modeling the fluid flow in the porous medium. Also, the effects of internal heat generation are investigated. The governing equations in terms of vorticity-stream function formulation are solved by an implicit finite difference technique based ADI and SLOR methods. In particular, the study is focused on the effects of different sources and sinks arrangements on the convective flow and associated thermal transport features.

1. Introduction

Buoyancy-driven convection in an annular geometry has been considered as an ideal heat transport tool in many industrial applications. Hence, many researchers investigated convective thermal transport in an upright annular space both experimentally and numerically. Initially, de Vahl Davis and Thomas [1] investigated convection in the vertical annulus where it is heated isothermally and suggested correlations for heat transport rates. Prasad and Kulacki [2] performed pioneering experiments in determining the effect of curvature ratio in an annular enclosure with uniform thermal conditions. Buoyancy convection in an upright annulus by maintaining constant heat flux at the inner wall is numerically analyzed by Keyhani et al. [3] and Khan and Kumar [4]. Kumar and Kalam [5] studied natural convection within an annular region and deliberated the inconsistencies existing among the numerical and experimental results. Oudina and Bessaih [6] performed magentoconvection of liquid metal in a vertical annulus by considering magnetic field in axial and radial directions. Sankar and Do [7] analyzed numerically the impact of localized heating on convective heat transport in an upright annular geometry with two heaters placed at inner cylinder. By considering different sizes and locations, Sankar

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Study of structural, morphological, optical and biomedical properties of pH based ZnO nanostructures

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ABSTRACT

Nano ZnO has been synthesized at different pH values using chemical precipitation technique. The X-ray diffraction pattern shows the hexagonal wurtzite phase of ZnO nanoparticles. The crystallite size is found to decrease with increasing the pH value. From FE-SEM analysis, it can understand with increasing the pH value from 8 to 12, the morphology of ZnO nanoparticles changed from hexagonal faceted structure to nanospheroid structure. The HRTEM images are in well accordance with the FE-SEM images. The average particle size of nanospheroid morphology is 31.1 nm. The SAED pattern confirms the crystalline nature with multifaceted growth of the samples. EDAX spectrum of ZnO nanoparticles at different pH values confirms the formation of Zn and O. The absorption spectrum of ZnO nanoparticles shows that the absorbance band is slightly shifted towards the lower wavelength with increasing the pH value. The band gap energy values (by Tauc plot relation) of the ZnO nanoparticles are found in the range of 3.0–3.03eV. FTIR spectra revealed the presence of the characteristic stretching vibrational band of Zn-O bonding at 445–418 cm^{-1} and this is shifted to lower frequency with increasing the pH value from 8 to 12. PL spectra of ZnO nanoparticles at various pH values exhibit a strong UV emission band and green emission band. The most intense green emission band is obtained for ZnO nanoparticles at pH12. The synthesized nanoparticles show potential antibacterial activity against Gram-positive (B. subtilis and *S. aureus*) and Gram-negative bacteria (P. auregenia and K. Pneumonia). The cytotoxicity of ZnO nanoparticles at pH12 was evaluated against Normal (L929) and Breast cancer cell line (MB231).

1. Introduction

ZnO semiconductor material has drawn much interest in recent days due to their unique application in various field of research such as gas sensors, highly functional photoelectron devices, catalysts and effective devices like laser devices which are common nowadays [1]. Zinc oxide (ZnO) has a large scope for various research groups as being wide band gap energy (3.37 eV) in a semiconductor with excellent electrical and optical properties. Zinc oxide nanostructures have an appreciable advantage in the catalytic

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Structural, optical and electrical properties of ZnO-ZnS nanocomposites prepared by simple hydrothermal method

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ABSTRACT

ZnO-ZnS nanocomposites with different molar ratio 25:75, 50:50 and 75:25 percentages were prepared by the simple hydrothermal method. The techniques used for the characterization of samples were X-ray diffractometry (XRD), scanning electron microscopy (SEM), energy dispersive X-ray (EDX) analysis, UV –visible diffuse reflectance spectrometry (DRS), Fourier transformed infrared (FT-IR) spectroscopy, dielectric and photoconductivity measurements. XRD patterns confirmed the crystalline nature of ZnO-ZnS nanocomposites. The calculated average crystallite size using Debye Scherrer's equation is in the range of 48–45 nm and 24-21 nm for ZnO and ZnS compound respectively. SEM images showed spherical morphology with agglomerated nanoparticles. The energy dispersive X-ray technique is opted for elemental mapping of ZnO-ZnS nanocomposite. Optical studies of UV-DRS reveal the band gap to be 2.07–2.11 eV. The FT-IR spectra confirmed stretching vibrations of ZnO and ZnS respectively. Dielectric properties like dielectric loss, dielectric constant and AC conductivity were studied. The photoconductivity measurement exhibits good photo response behavior in the nanocomposite materials.

1. Introduction

Recently, semiconductor nanomaterials/nanocomposites have recognized extensive scope in multidisciplinary areas such as sensor materials, electrochemical, magneto-optical, bio-medical and photo-catalytic activity than that of their same bulk materials due to their unique morphology, size and surface effects [1–5]. Also, the use of semiconductor nanomaterials/nanocomposites in modern applications as photovoltaic production, energy production has paved the way to open research in the field of nanomaterials and materials science [6–10]. Nanostructured materials are eternally unique and exhilarating in the field of materials science. In the past few years, semiconductor nanoparticles have attracted in both technological and theoretical research [11–17]. Among other nanocomposite material, ZnO:ZnS is a well known hexagonal and cubic structure as it possess high electrochemical stability, high electron mobility and non-toxic [18,19]. Hence wide band gap semiconductor nanomaterials have attracted extensive attention due to their size-dependent properties and essential technological applications [20–22]. Among the metal oxides, nanostructured ZnO and ZnS are alluring materials due to their unique properties such as high surface area to volume ratio and energy band gap. ZnS is a wide direct band gap material (3.54 eV zinc blende and 3.91 eV wurtzite) and it is a non-toxic semiconductor which can be observed naturally in two phases [23–26]. First one is the wurtzite structure with hexagonal phase and the second one is the zinc blend structure with cubic phase [27]. Further at room temperature, the band gap value of zinc oxide is 3.37 eV and has established wide research because of its advantages such as small size effect, large specific surface area and wide application potential in mildew removal and microbial inhibition [28–30].

Recently, Manikandan et al. reported various nano-composites prepared by simple combustion method for the application of photo-catalytic degradation of organic pollutants (MB, 4-CP)

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Psidium guajava leaf extract-mediated synthesis of ZnO nanoparticles under different processing parameters for hydrophobic and antibacterial finishing over cotton fabrics

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ABSTRACT

In recent times, treatment of natural fibres, like cotton, with antimicrobial finishing using nanoparticles has become increasingly high due to the possibility of anticipated property and their tuneable nature. In this study, using the phytoconstituents of leaf extract of *Psidium guajava*, Zinc acetate was reduced to obtain ZnO nanoparticles using three different synthesis routes namely sonication, wet-chemical and hydrothermal methods. To evaluate and get a broader understanding about the influence of processing parameter over the ZnO nanoparticles, physico-chemical, biological and photocatalytic property, a comparative assessment was performed. The ZnO nanoparticles were subjected to X-ray diffraction, particle size analysis and scanning electron microscope to ascertain its structure/morphology. The comparative studies reveal that hydrothermal method of ZnO synthesis yields smaller particle size (12 nm), with higher photocatalytic activity (94%), higher antibacterial activity against *Escherichia coli* (27.4 mm) and *Staphylococcus aureus* (29.3 mm) and lower structural defects comparing to ZnO synthesised via other methods of synthesis. Furthermore, the most effective ZnO nanoparticles (hydothermal method) was incorporated in chitosan and coated over the cotton fabric to functionalise cotton fabrics for better antimicrobial and water repellent property. Along with the same line, the ZnO nanocomposite coated fabrics exhibit better hydrophobic (157 ± 0.1°) (superhydrophobicity) and higher antibacterial activity (30.58 ± 0.3 mm (99%) (*S. aureus*) and 24 ± 0.5 mm (96%) (*E. coli*)), which could be attributed to ZnO particle size and favourable structural morphology. Thus, the study not only reveals the tuneable nature of the ZnO nanoparticles with respect to processing parameters and also shows the potential role in coating these nanoparticles over the cotton fabrics to impart an effective antimicrobial and hydrophobic finishing for biomedical applications.

1. Introduction

Materials controlled to nano regime (i.e., particle size less than 100 nm) shows atom like behaviour due to the high surface to volume ratio and quantum size effect [1–3], leading to a critical and unique role in array of fields such as biomedical engineering [4,5], tissue re-

cotton fabrics, is responsible for the growth of microbes such as *Staphylococcus aureus* (*S. aureus*) and *Staphylococcus epidermis* (*S. epidermis*) which in turn, leads to skin infections such as boils, impetigo, cellulitis, and furuncles [11,13,14]. Along with the aforementioned fact, the growth of the microorganisms over the textile materials usher leads to discoloration and reduction in textile efficiency [10]. The meteoritic

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Research Article

FORMULATION AND CHARACTERIZATION OF PAPAIN LOADED SOLID LIPID NANOPARTICLES AGAINST HUMAN COLORECTAL ADENOCARCINOMA CELL LINE

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ABSTRACT

Objective: Colorectal cancer is one of the most commonly diagnosed cancer and also most common gastrointestinal malignancy with high prevalence rate in the younger population. Usually, cancer cells are surrounded by a fibrin coat which is resistant to fibrinolytic degradation. This fibrin coat is act as self-protective against natural killing mechanism. The main objective was to prepare papain-loaded solid lipid nanoparticles (P-SLN) by melt dispersion-ultrasonication method and investigated the cytotoxic efficacy against colorectal adenocarcinoma (human colorectal adenocarcinoma [HCT 15]) cells.

Methods: Optimized polymer ratio was characterized by differential scanning calorimetry, Fourier-transform infrared, X-ray diffraction, scanning electron microscopy, entrapment efficiency, particle size and zeta potential analysis, *in vitro* drug release, and *in vitro* cytotoxicity studies on HCT-15 colorectal adenocarcinoma cells.

Results: The results showed that the particle size, morphological character and zeta potential value of optimized batch P-SLN were 265 nm, spherical and −26.5 Mv, respectively. The *in vitro* drug profile of P-SLN exhibited that it produced sustain drug release, and the cell viability of HCT-15 against P-SLN shown better efficacy than pure papain enzyme.

Conclusion: P-SLNs were successfully prepared and investigated the *in vitro* drug release and *in vitro* cell viability against HCT-15 cell line.

Keywords: Papain, Solid lipid nanoparticles, Cytotoxic potential, Proteolytic enzyme, *In vitro* drug release.

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INTRODUCTION

Colorectal cancer or bowl cancer is the second leading cause of mortality around the world, and more than 1.2 million patients are diagnosed with colorectal cancer every year, and more than 600,000 die from the disease [1]. Almost 25% of patients who present with colorectal cancer present with metastatic disease and thousands of patients receive treatment for metastatic CRC each year [2]. The approximate survival period for patients with metastatic CRC is around 20 months; however, most of the patients still die of their disease [3]. Since the launch, 5-fluorouracil (5-Fu) remains one of the most efficient and widely used drugs to treat colorectal cancer. On the other hand, inherent and acquired resistance is major obstacle to 5-Fu to achieve the effective clinical efficacy in CRC therapy. Therefore, it is essential to identify the mechanisms of resistance as a primary task to move toward to preventing or reversing chemoresistance in metastatic CRC patients [4]. The coating on the cancer cell is made of mucus and fibrin is one of the mechanism which responsible for chemoresistance. This fibrin (biofilm) protective coat prevents the white blood cells of the immune system from recognizing the cancer cell [5]. This protective fibrin layer may lead to the metastasis process because these cancer cells easily escape from immunosurveillance mechanism and also the

now, papain has not emerged any lipid-based drug delivery system to treat any type of cancer. Henceforth, we have proposed papain as a potent chemotherapeutic agent in treating colorectal cancer.

In spite of its wide pharmacological activity, it is unstable at room temperature and inactivated by acidic pH at the stomach [7]. Solid lipid nanoparticles (SLN) have been considered as a most promising drug delivery system to achieve better therapeutic outcome compared with conventional delivery. SLNs possess the numerous advantages than polymeric nanoparticles and liposomes [8]. SLNs are made of biodegradable and biocompatible lipidic carriers, which are principally solid state at room temperature [9]. Several investigations have revealed that SLNs have high drug loading capacity for both hydrophilic and lipophilic drugs [9], feasible for large-scale production [10], and long-term storage stability [11]. In addition, stealth SLNs with particle size ≤200 nm are infrequently subject to blood clearance by the reticuloendothelial system in the liver and spleen [12]. SLNs are flexible nanocarriers and are used for drug delivery in nearly all routes of administration, including ocular [13], parenteral [14], oral [15], and topical [16]. SLNs can be formulated to sustain the drug release profile and therefore decrease the necessity for the repeated administration and enhance the therapeutic value of the treatment [17]. The aim of this

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Research Article

IN VITRO AND *IN VIVO* ANTIANGIOGENIC EFFECT OF *ARTOCARPUS HETEROPHYLLUS* SEED EXTRACT

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ABSTRACT

Objective: Angiogenesis the formation of new blood vessels from the pre-existing vasculature plays a major role in tumor growth, invasion, and metastasis of cancer diseases. The current research was designed for the inhibition of angiogenesis, which can provide a novel way to inhibit tumor growth and metastasis in cancer.

Methods: The antiangiogenic properties of serial concentrations of the hydroethanolic extract of *Artocarpus heterophyllus* were examined in human umbilical vein endothelial cells (HUVECs) using a tube formation assay *in vitro* and in a Matrigel plug assay as *in vivo* model.

Results: Hydroethanolic extract of *A. heterophyllus* significantly inhibited vascular endothelial growth factor (VEGF)-mediated angiogenesis in the HUVECs in culture dose-dependently. Further, the new blood vessel formation was observed to be inhibited by the extract at 100 mg/kg p.o. in Matrigel plug model in C57BL/6 mice. However, the effect was enhanced in higher concentration (500 mg/kg p.o.) demonstrating the *in vivo* antiangiogenic activity of the extract.

Conclusion: This study demonstrated that the hydroethanolic seed extract of *A. heterophyllus* strongly inhibited the angiogenesis in HUVECs. Moreover, the extract significantly inhibited the VEGF production in HUVECs, confirming their possible antiangiogenic mechanism.

Keywords: Angiogenesis, Vascular endothelial growth factor, Human umbilical vein endothelial cells.

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INTRODUCTION

including effects on cytoskeletal proteins which play a key role in cell

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Bioaccumulation of Transition Metal Oxide Nanoparticles and Their Influence on Early Growth Stages of *Vigna unguiculata* Seeds

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Abstract
A reasonable understanding of the impact and health risk of the metal oxide nanoparticles treated on edible plants is necessary in order to use nanomaterials in food and medicine. In this study, we investigate the uptake and toxic response of transition metal oxides, namely Fe_2O_3, CuO and ZnO nanoparticles synthesised by co-precipitation method using nitrate salts of the respective metals as precursors. The characterisation of all the prepared nanoparticles shows the purity above 97% with rod-like morphology. Cowpea (*Vigna unguiculata*) seeds are soaked in a monodispersed solution of nanoparticles and kept for seed germination and plant growth. Transport and accumulation of the nanoparticles treated in the seeds are assessed through X-ray fluorescence spectroscopy which confirms the uptake of the nanoparticles with respect to the treatment regime. The seeds soaked in CuO nanoparticles reveal better seed germination percentage, an increased coleoptile length and a plant height at 100 ppm concentration than other nanoparticles. This study proves the limitation of CuO nanoparticle application for better growth of cowpea plants whereas iron and zinc oxide nanoparticles show promising response in plant growth, uptake and bioavailability in seeds even at higher treatments.

Keywords Transition metal oxide · Nanoparticles · Uptake · Cowpea · Phytotoxicity

1 Introduction

Engineered nanoparticles are synthesised to achieve unique physico-chemical and functional properties in order to make them valuable for numerous applications. However, it also has the potential to trigger adverse effects [1] upon tremendous release in the environment. The current knowledge about abundantly used nanoparticles and the challenges of nanotoxicity assessment lead to a lack of effective regulation on the use of nanoparticles. Toxicological studies reveal that the engineered nanoparticles are potentially harmful due to their high surface area and unique physico-chemical properties (size, surface properties and crystal phase) [1]. Metal oxide nanoparticles, mainly transition metals, have currently of great technological importance. They also possess ability to block ultraviolet light which enables them to be used as sunscreens in cosmetic industry [2]. ZnO and TiO_2 are the most widely used nano-metal oxides in cosmetic industry [3, 4] while iron nanoparticles are the most accepted nanoparticles in environment remediation, photo catalytic reactions and food processing applications [5].

Plants are known to be the producers upon which all other living organisms are depended. Plants can be a route for the bioaccumulation of nanoparticles [2]. Hence, analysing the fate of the nanoparticles in plant systems, their transport and accumulation is essential to explore the adverse effect of nanoparticles. Size, surface characteristics and high surface area to volume ratio of the nanoparticles play a part in their beneficial

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ORIGINAL ARTICLE

Influence of solvents on the changes in structure, purity, and in vitro characteristics of green-synthesized ZnO nanoparticles from *Costus igneus*

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Abstract
The present study is intended to produce high-purity zinc oxide nanoparticles from the leaves of *Costus igneus* and zinc acetate precursor via sustainable methods by the tribulation with three different solvents (hot water, methanol, and acetone) for the extraction of plant compounds. While examining the physico-chemical characteristics of ZnO nanoparticles incurred by the catalysis of plant bioactive compounds extracted from different solvents, the hot water extract-based green synthesis process yields higher purity (99.89%) and smaller particle size (94 nm) than other solvents. The optimization of the solvents used for the green synthesis of nanoparticles renders key identification in appropriate extraction of bioactive compounds suitable for the nucleation/production of nanoparticles in addition to annealing temperature. The impregnable usage of ZnO nanoparticles in clinical applications is further confirmed based on the treatment of particles (1–10 mg ml^{-1}) against Gram-positive (*S. aureus* and *S. epidermis*) and Gram-negative bacteria (*E. coli* and *K. pneumoniae*) with respect to their growth inhibition. An in-force growth inhibition against particular *S. aureus* and *S. epidermis* imparted by the low concentration of ZnO nanoparticles signifies the utilization and consumption of green-synthesized high-purity nanoparticles for therapeutic and cosmetic applications.

Keywords ZnO nanoparticles · Green synthesis · *Costus igneus* · Solvent extraction · In vitro

Introduction

Green and sustainable synthesis of nanoparticles from plants is nowadays gaining momentum due to the abundance and diversity of plant sources, cost-effectiveness, biocompatibility, and environment-friendly approaches (Salam et al. 2014; Agarwal et al. 2017). In fact, plant-mediated nanoparticles' synthesis avoids the use of sophisticated equipment, large space, and extreme processing conditions. Phytochemical components of the plants play a vital role in synthesizing nanoparticles of interest from their respective precursors. Numerous projects are dedicated to green synthesis of metal oxide nanoparticles for different applications from different vegetable sources of the plant (Iravani 2011; Makarov et al. 2014; Silva et al. 2015). However, the productivity, purity, and structure of such nanoparticles synthesized varies from plant to plant and also parts to parts of the same plant. The extract of the plants is known to be rich in organic/inorganic constituents that act as effective chelating agents for nanoparticles' synthesis. The above constituents play a major role either as reducing or capping/stabilizing agent.

Green synthesis of zinc oxide (ZnO) nanoparticles (NPs) from plants is one of the emerging interests to develop potent nanostructured biomaterials (Ramesh et al. 2015; Nagajyothi et al. 2013; Yuvakkumar et al. 2014;

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Research Article

Free radical scavenging activity from hydroethanolic extracts of *Artocarpus heterophyllus* seeds

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ABSTRACT

Objectives: Free radicals are highly reactive and destructive molecules constantly produced in the human body as a result of oxidative stress. Antioxidant substances can prevent or delay oxidative damage by scavenging the radicals. Thus, the current research focuses on the free radical scavenging activity of *Artocarpus heterophyllus* seed extracts. **Methods:** Radical scavenging activity of the hydroethanolic extracts of spermoderm and cotyledon of *A. heterophyllus* was assessed in different concentrations against *in vitro* generated radicals such as 2,2'-diphenyl-1-picrylhydrazyl, hydrogen peroxide, hydroxyl, and nitric oxide. **Results:** The hydroethanolic extract of spermoderm showed good dose-dependent free radical scavenging activity when compared to cotyledon extract, and the result was compared with the standard at the same concentration. **Conclusion:** Extracts of *A. heterophyllus* showed considerable scavenging activity against the radicals generated *in vitro* in a dose-dependent manner. Hence, the extracts can be used for the treatment of various diseases caused by radicals.

KEY WORDS: 2,2'-diphenyl-1-picrylhydrazyl, Antioxidant, *Artocarpus heterophyllus*, Free radicals

INTRODUCTION

Free radicals are atoms or molecules which contain one or more unpaired electrons, so it attempts to pair with other molecules to attain stable configuration. They are reactive chemical species produced by organisms for normal use of oxygen. The unstable configuration produces energy which is unconfined on reaction with adjacent molecules such as carbohydrates, proteins, and DNA. Most of the free radicals which damage the biological system are derived from oxygen and hence referred to these radicals as reactive oxygen species (ROS).[1] ROS such as superoxide anion radical O_2, hydrogen peroxide (H_2O_2), alkoxy (RO), peroxyl (ROO), hydroxyl radical (OH), and hypochlorous acid (HOCl) as well as reactive nitrogen species such as nitric oxide (NO) and peroxynitrite are known to may act to control the level of free radicals to counteract oxidative damage. The effects of medicinal plants in prevention and treatment of many diseases have been widely attributed to their antioxidants activities.[3]

Antioxidants present in plants may protect cells from the damage of free radicals. Antioxidant may be either the natural ones or synthetic ones. Natural antioxidants, which are obtained from plant having greater benefit in comparison to the synthetic antioxidant.[4] In recent years, treatments of many diseases by alternative medicine or natural products are interesting; plants as a source of phytochemical compounds and secondary metabolites play a major role in their medicinal properties. Most of the drugs used today are derivatives of naturally occurring compounds and, hence, a reservoir of anticancer agents. The use of medicinal

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Enhancing the thermophysical and tribological performance of gear oil using Ni-promoted ultrathin MoS_2 nanocomposites

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ARTICLE INFO

Keywords:
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Antiwear

ABSTRACT

This paper presents the enhancement of thermophysical and tribological properties of oil soluble Ni-promoted ultrathin MoS_2 nanocomposites blended with gear oil (SAE 75 W). The Ni-promoted ultrathin MoS_2 namely Ni-MoS_2 nanosheets was exfoliated chemically using ultrasonication and simple reflux techniques. The as-synthesized additives blended with gear oil (i.e., 0.5 wt% of micro MoS_2, MoS_2 nanosheets and Ni-MoS_2 nanosheets) were tested for their thermophysical and tribological properties by using four ball wear tester according to ASTM D2783 standard. The obtained thermophysical and tribological characteristics reveals that the synergetic interaction of Ni and MoS_2 nanosheets have better dispersibility and more suitable lubricant additive for extreme pressure region. Thus, the above research enriches the tribological phenomena of transmission elements in the mechanical industry.

1. Introduction

The most important key challenge in modern automotive developments is the enhancement of friction power losses [1]. Gears or cogwheels are important machine elements which contribute to transmission of motion by means of engaging teeth [2]. Automotive gearboxes expected to perform heavy loads at high speeds and harsh conditions, undergo frictional damages and surface failures [3]. In order to prevent these failures, high performance lubricants are needed to improve the efficiency and durability of tribological components operating under extreme pressure conditions. Lubrication is an effective way to reduce the frictional power losses preventing the gear against wear [4].

Nowadays, smart lubricants consist of base oil blend with special additive packages to protect and control the gear against friction and wear under conditions like extreme pressure and temperature [5]. The use of nanomaterials as a lubricant additive in tribology management is widely explored in recent years due to their small size and large surface material used in modern automotives due to its unique physico-chemical properties [10–12]. The excellent solid lubricating property of MoS_2 contributes to very low sliding friction under extreme pressure and temperature [13]. The 2H hexagonal lamellar layer arrangements with strong S-Mo-S sandwiched structure (Mo atom sandwiched between two layers of closely packed S atoms) make more stable lubricating film between the frictional pairs [14,15]. Moreover, a strong covalent and weak Vander Waals forces between the atomic bonds and molecular layers confirm its superior tribological characteristics [16].

Over the past few decades, different nanostructured additives like Inorganic Fullerene (IF) nanoparticles, nanosheets, nanoflowers, nanorods and nanotubes are widely developed to investigate the lubricant performance of MoS_2 [17]. The study on the behaviour of IF-MoS_2 nanoparticles for ultra-low friction between tribo-interfaces revealed reduction of coefficient of friction (μ) from 0.12 to 0.06 in case of base oil containing IF-MoS_2 nanoparticles [18]. The study of IF-MoS_2 nanoparticles shows an excellent friction and exceptional antiwear (AW)

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Effects of multiple slip on MHD combined convective flow of viscoelastic nanofluid over a stretchy sheet with heat absorption

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Abstract We explore the impact of MHD combined convective flow of viscoelastic nanofluid over a stretchy sheet with heat absorption & multiple slip conditions. The similarity variables are employed to convert the PDE's into dimensionless ODE's and they are solved using homotopy analysis method (HAM). The impact of governing parameters on the velocity, temperature & nanoparticle concentration are analyzed with the help of tables and graphs.

Keywords: Viscoelastic nanofluid, magnetic field, heat absorption, slip boundary conditions.

1. Introduction

The convective heat transfer of nanofluids are imperative in huge number of industrial and engineering applications, like, biological sensors, advanced nuclear systems, electronic devices, hybrid-powered engines. Many authors are interested to study the nanofluids. Ahmed et al. [1] investigate the nanofluid flow over a stretching tube. Some significant studies on these directions are [2]-[4]. In petroleum production, fabrication of adhesive tapes, drawing of paper films, etc, the non-Newtonian materials are essential. Due to these applications, more researchers are examining the behavior of non-Newtonian materials. Viscoelastic fluid is a subclass of non-Newtonian fluid and having both viscous and elastic behavior. Several studies in this literature, like, Cortell [5], Abel and Mahesha [6], Eswaramoorthi et al.([7]-[9]) are examined the viscoelastic fluid model without nanofluids. Shit et al.[10] examined the heat transfer characteristic of a viscoelastic

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FUZZY MECHANISM FOR GAUSSIAN NOISE REDUCTION FOR SATELLITE IMAGE ENHANCEMENT

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ABSTRACT

Noise removal or noise reduction is one of the thrust research dimensions in the field of image processing, computer vision and pattern recognition. This paper envisages fuzzy mechanism towards gaussian noise reduction for satellite image processing. The membership functions generated using image histogram is considered. Then noise removal is carried out by fuzzy technique followed up with pixel classification, restoration and filtering. Images are taken from multispectral datasets from Quickbird, Geoeye, SPOT and IKONOS satellite. Performance metrics such as ERGAS, QAVE, RASE, SAM, FCC, PSNR, MSSIM and RMSE are taken and the results shows that the proposed mechanism outperforms than that of the existing methods.

Keywords: *Satellite Image, Noise Removal, Pixel Classification, Restoration, Filtering, Image Dataset.*

1. INTRODUCTION

Satellite image processing is fetching a significant importance recent years due to its wide range of applications in military security.

Denoising also called as noise reduction or noise removal is one such preprocessing task which reduces or removes noise from the satellite images. Once after removal / reducing of noise from the

Journal of Advanced Research in Dyna

Acceleration Artificial Bee Colony Optimization-Improved Transductive Support Vector Machine for Efficient Feature Selection in Big Data Stream Mining

S. Meera and Dr.B. Rosiline Jeetha

Abstract:

High dimensional data seen in a practical issue imposes a hurdle for large data analysis. Attribute reduction or feature selection aids the learning algorithm to work with efficiency by eliminating unnecessary and repetitive information in the big data. The existing system like Acceleration Particle Swarm Optimization Support Vector Machine (APSO-SVM) is proposed in order to deal with the above challenge. But the already existing technique has issues in addition to the pre-processing technique and optimal feature selection for scalable dataset. Therefore the system s overall performance is decreased significantly. With the aim of eliminating these problems, in the proposed system, Acceleration Artificial Bee Colony Improved Transductive SVM (AABC-ITSVM) is introduced so as to improve the system performance in a more efficient manner. The proposed system comprises of three important modules like preprocessing, feature selection and classification. The preprocessing is carried out by making use of min-max normalization algorithm that assists in increasing the classification accuracy more. Thereafter the feature selection is carried out by employing AABC optimization algorithm that is utilized for selecting the significant and necessary features from the data that is preprocessed. The selected features are classified by employing ITSVM algorithm. The ITSVMs gets the labeling of the test features, which increases the margin conjoined on the training and the test data. It yields classification results with more accuracy for the datasets specified. The proposed system offers great performance with regard to superior accuracy, recall, sensitivity, specificity, precision, f-measure, gmean, and lesser selected features, time complexity by utilizing the AABC-ITSVM technique.

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Dynamic and reliable intelligent data mining technique on social media drug related posts

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D. Krithika Renuka ; B. Rosiline Jeetha **All Authors**

1 Paper Citation

91 Full Text Views

Abstract

Document Sections

I. Introduction

II. Related Works

III. Dynamic Analysis of Drug Information Present in the Web Database

IV. Experimental Results

V. Conclusion

Abstract:

Social media attracts millions of users to share their interests and opinions with other users in the flexible way. Medical organizations started to share their information about newly developed drugs through social media. It provides flexible platform for millions users to share their opinions about the newly developed drugs. With that information various peoples who suffered from disease might get an opinion about them. Analyzing various kind of drugs information posted by the millions of users is a most difficult task which is researched by various authors. In the existing work, two-step analysis framework is implemented which focuses on positive and negative sentiment extraction. It is done for the purpose of ascertaining user opinion of cancer treatment. It is done by using a self-organizing map to analyze word frequency data derived from users' forum posts. However in the existing system is a static model where only the older posts that are posted by the users online previously are considered which might lead to less accurate detection of consumer opinions. It utilizes only static dictionary about the drugs where the newly introduced drugs cannot be identified. This problem is resolved in the proposed research method namely Dynamic Drug Data Analysis using Hybrid Transductive Support Vector Machine with Fuzzy C Means algorithm

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Review article

Pharmacological benefits of neferine - A comprehensive review

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ABSTRACT

This article recapitulates the existing *in vitro* and *in vivo* studies focusing on the effects of neferine-an alkaloid derivative of lotus plant, in various disease models and its effects on key signaling molecules. The review also compiles a large number of research studies that demonstrate methods for isolation and extraction, biosynthetic pathway, pharmacological activity and mode of action of neferine and their underlying mechanisms at cellular level. Neferine is a unique bis-benzylisoquinoline alkaloid that possesses a number of therapeutic effects such as anti-cancer, anti-diabetic, anti-aging, anti-microbial, anti-thrombotic, anti-arrhythmic, anti-inflammatory and even anti-HIV. It also enhances the anti-cancer properties of other anti-cancer drugs like cisplatin, adriamycin, taxol, *etc.* It is also reported to reverse chemo-resistance and enhance sensitivity of the cancer cells towards anti-cancer drugs. The underlying mechanisms for its activities mainly include apoptosis, autophagy and G1 arrest. Neferine protects them against the effect of drugs like cisplatin. The therapeutic properties of neferine is widely diverse, while it shows toxicity to cancer it also shows cyto-protective effects against cardio-vascular diseases, pulmonary disease, and is also effective against Alzheimer's disease and elicits anti-oxidative effect in many cellular systems. This article thus is the first ever attempt to review the therapeutic activities of neferine established in *in vitro* and *in vivo* models and to compile all the fragmented data available on the omnipotent activities of neferine.

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PREPARATION AND CHARACTERIZATION OF ALKALINE ELECTROLESS Ni-B NANO DEPOSITION ON MILD STEEL IN THE PRESENCE OF *AZADIRACHTA INDICA* GUM

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ABSTRACT

The current research work deals with the alkaline electroless Ni-B plating of mild steel in the presence of *Azadirachta indica* gum (GAI). The deposited Ni-B film on mild steel surface was analyzed using FT-IR and Scanning Electron Microscope (SEM) techniques. The amorphous nature of Ni-B deposits on mild steel was confirmed by XRD. The amount of Nickel and Boron content on deposited Ni-B film on mild steel surface was investigated by Energy Dispersive X-ray Analysis (EDX).

Keywords: Electroless Ni-B plating, *Azadirachta indica* gum, mild steel.

INTRODUCTION

Based on the nature of the reducing agent used, the electroless nickel coatings[1] are usually classified into two types namely Ni-P and Ni-B deposits. Nowadays researchers shift more attention towards Ni-B plating because of their widespread acceptance of Ni-P deposit[2,3]. In general, $NaBH_4$ [4-10] or $(CH_3)_2NHBH_3$

Article

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Occupational exposure to photocopiers and their toners cause genotoxicity

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Abstract

Photocopier machines are inevitable office equipment, but they are also sources of air pollution. Millions of people across the world are involved in the operation and maintenance of photocopiers. We aimed to evaluate the potential genotoxic effects of exposure to photocopiers in photocopier operators and maintenance personnel by Comet assay. This study involved 50 photocopier operators, 61 maintenance personnel and 52 controls. Both the photocopier exposed groups exhibited significantly increased DNA damage when compared to controls. Cumulative exposure to photocopiers was the most significant contributor for genotoxicity ($p < 0.001$). Genotoxicity among photocopier maintenance personnel may be due to the presence of carbon black, iron, silicon, magnetite and the high levels of other elements in the photocopier toners. Genotoxicity among photocopier operators might be due to exposure to high levels of particulate matter and volatile organic compounds emitted by photocopiers during operation. Research is essential to improve toner manufacturing processes and chemical composition of toners to reduce genotoxicity. Clean technologies are the need of the day to cut down on particulate matter and volatile organic compound emissions from photocopiers.

Keywords

Photocopier, genotoxicity, toner, occupational exposure, maintenance personnel

Introduction

Photocopier machines are inevitable office equipment in recent days of automation. Millions of workers earn a living through the photocopier industry across the world. The process of photocopying has also undergone a quantum shift in terms of technology, ease of operation, raw materials, output and versatility.[1] The changing landscape of technology has also fuelled the

on a host of poorly understood factors such as photocopier's model, cartridge age, toner, electrostatic discharge, printer age, fuser temperature, page coverage, paper type, mode of operation, printing frequency and maintenance cycles.[11–12,16–17] A range of other materials in photocopy centres, such as presence of printed documents, cleaning solvent, office furniture, building materials, flooring materials and other office equipment may also influence the emissions.[6]

Heterogeneous and Homogeneous Reaction Analysis on MHD Oldroyd-B Fluid with Cattaneo-Christov Heat Flux Model and Convective Heating

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Keywords: Oldroyd-B fluid, MHD, Cattaneo-Christov heat flux, Heterogeneous-homogeneous chemical reactions, convective heating

Abstract. The impact of Cattaneo-Christov heat flux model for the MHD flow of an Oldroyd-B fluid on a stretching plate with convective heating and heterogeneous-homogeneous chemical reactions were analyzed. The governing PDE's are converted into a nonlinear ODE's with appropriate similarity variables and it is solved using homotopy analysis method (HAM). The graphical results of velocity, temperature and concentration profiles are presented(detailed). We found that the fluid velocity reduces with enhancing the injection/suction parameter. In addition, the fluid temperature boosted up when rising the Biot number and the solutal boundary layer thickness reduces both heterogeneous and homogeneous chemical reaction parameters.

Introduction

The study of non-Newtonian fluids are significant in many applications in engineering and industry. Silly putty, printer ink, custard, molten polymers, blood plasma are some examples. These fluids does not satisfy the "Newton's law of viscosity", that is these fluids they change their flow behavior with respect to stress. Also, it cannot be interpreted the characteristics of non-Newtonian fluids as a single constitutive relationship. Various investigators are developed the different models of such fluids. The Oldroyd-B fluid model is one of the non-Newtonian fluid model which can describes the retardation and relaxation effects. Bilal Ashraf et al. [1] examined the Oldroyd-B fluid flow with convective heating. They concluded that the fluid temperature rises on enhancing the relaxation time. The quite opposite result was obtained for retardation time case. Few important studies on this directions with different physical configurations are found in the studies ([2]-[5]).

Magneto-hydrodynamic (MHD) is the study of behavior of the electrically conducting fluids with magnetic properties. This property is mainly used in manufacturing industry, such as electrostatic precipitation, MHD pumps, power generators, liquid-metal cooling of nuclear reactors, etc. Due to these applications, various researchers were made to investigate the MHD flow behavior. MHD flow behavior of a viscoelastic fluid was examined by Eswaramoorthi et al. [6]. Their result shows that the fluid velocity reduces with enhancing the magnetic field. Few significance studies in this directions are given in the Refs. ([7]-[19]).

The heat transfer phenomenon is a vital property in nature and it occurs in different temperature between the same or different objects. In this direction, the famous law of heat transfer, namely, "Fourier's law of heat conduction" was initiated by Fourier [20]. But, this is inadequate the parabolic energy equation for the temperature field which indicates that the total system is immediately affected by the initial disturbance. Several researchers were made to overcome this restriction and to modify the "Fourier's law of heat conduction". Cattaneo [21] modified the "Fourier's law" and to include the

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Synergistic effect between Gum Exudates of *Eucalyptus globles* and 2,6-diphenyl-3-methylpiperidin-4-one on Corrosion Inhibition of MS in 1N HCl

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ABSTRACT

Gum exudates of *Eucalyptus globles* (GEG) was identified as green inhibitor for MS dissolution in 1N HCl using gravimetric method at 303-323K. Efficiency of GEG was synergistically increased with addition of 2,6-diphenyl-3methyl-piperidin-4-one (3MDPP). The binary combination of GEG and 3MDPP shows maximum inhibition potency and their S_g value is >1 indicating that synergism exists between GEG and 3MDPP. Mechanism of inhibition of inhibitors on MS is physisorption and it obeys Langmuir's isotherm. Polarization and impedance measurements confirm that inhibitors act as mixed type.

Keywords: 3MDPP, GEG, Binary mixture, Mild steel, Synergism.

INTRODUCTION

In many industries corrosion is a major problem for materials during acid pickling or chemical cleaning. Recently plant gum exudates are found to be non-toxic green corrosion inhibitors for various metals in different media due to its good adhesive and polymeric nature[1-13]. These exudates protect the metal surfaces by adsorption through physical or chemical bonding. But inhibition performance and stability of these gum exudates are found to be less significant at higher temperature. Some researchers use metal cations and halide ions as external additive to enhance their inhibition performance[14,15].

A thorough survey of literature reveals that, no work has so far been done on the influence of organic compounds as synergist for corrosion inhibition behavior of plant gum exudates and also their stability. So the present work aims to study the corrosion inhibition properties of gum exudates of *Eucalyptus globles* (GEG) towards the corrosion of MS in 1N HCl at 303-323K for 1 h, immersion period. At higher temperature the stability and efficiency of GEG was enhanced by addition of external synergist (3MDPP). In acidic medium, 3MDPP act as very good corrosion inhibitor[16]. Therefore the influence of 3MDPP on the inhibition character of GEG towards MS is studied in 1N HCl at 303-323K. Because

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Immunostimulatory Potential of Papain Encapsulated Solid Lipid Nanoparticles

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papain enzyme, immune function, lymphoblast cell, cytokines, cancer metastasis, lymphatic system.

ABSTRACT

Stimulation of immune function is the primary focus in the field of cancer metastasis treatment. Cancer cells are circulated through the lymphatic system to support metastasis to lymph nodes and adjacent organs. In order to treat metastatic cancer, the immune function should be reactivated to recognize the cancer cells against the natural killer activity and expose the cancer cells to the chemotherapy. Proteolytic enzymes have been explored in cancer therapy including the inhibition of metastasis and improve the body immune mechanism. To achieve this hypothesis, we proposed papain loaded solid nanoparticles to stimulate the immune mechanism by investigating the following; (i) measurement of human lymphoblast cells using TK6 Spleen lymphoblast cell line (ii) proliferation of T cells and secretion of cytokines (IL-2 and IL-4) using T-lymphocytes 8E5 cells (iii) determination of in-vitro cytokines production by activated macrophages. This research evidenced that papain loaded solid lipid nanoparticles possess significant immunostimulatory efficacy, thus it can be proposed as an adjuvant therapy for cancer metastasis.

INTRODUCTION

Most of the cancerous cells are migrated through the lymphatic system to develop metastasis at lymph nodes (LNs) and adjacent organs (Karaman and Detmar, 2014). Cancer-related lymphatics and leaking LNs are responsible for cancer cell migration and invasion. Secondly, the lymphatic system absorbs and immune mechanisms. Additional factors including cellular modification due to infection, disease-induced stress also responsible for cancer growth or suppression (Senger *et al.*, 1983). Usually, CD4+ helper T (Th)1 cells and CD8+ cytotoxic T cells (CTL) control cancer development involving their secretion of cytotoxins and interferon (IFN)-γ (Alberts *et al.*, 2002). However

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Light trapping and power conversion efficiency of P3HT : nano Si hybrid solar cells

Murugan Vinoth,[a] Sundaramoorthy Arunmetha,[a] Mathu Sridharpanday,[a] Subramani Karthik[a] and Venkatachalam Rajendran *[ab]

In this study, the hybrid solar cells (HSCs) were fabricated with high-purity nano Si from nano SiO_2 precursor extracted from natural minerals, that is, quartz sand. The prepared nano Si was used as an electron transport material to prepare an active layer material mixture with poly(3-hexylthiophene) (P3HT) by mixing it in two composition ratios, namely 1 : 1 and 1 : 0.8. The blended active layer solutions (ALSs) were prepared by using solvents such as 1,2-dichlorobenzene (DCB), chlorobenzene (CB), and chloroform (CF). The HSCs were fabricated using six blended ALSs, namely ALS1, ALS2, ALS3, ALS4, ALS5, and ALS6. The current density–voltage characteristics of the fabricated HSCs were studied using a simulated AM 1.5G illumination having light density power of 100 mW cm^{-2}. The characterization properties such as short circuit current density (J_{sc}) and power conversion efficiency (PCE) were studied and compared with those of all six HSCs fabricated with six blended ALSs. At the outset, the P3HT : nano-Si (1 : 0.8) blended ALS in CB solvent shows 2.37% PCE, and 46% of external quantum efficiency (EQE) absorption which is higher than the other fabricated solar cells. This study discusses the possibilities of preparation of nano Si from natural mineral sand, as an effective electron transport material to fabricate HSCs with enhanced PCE.

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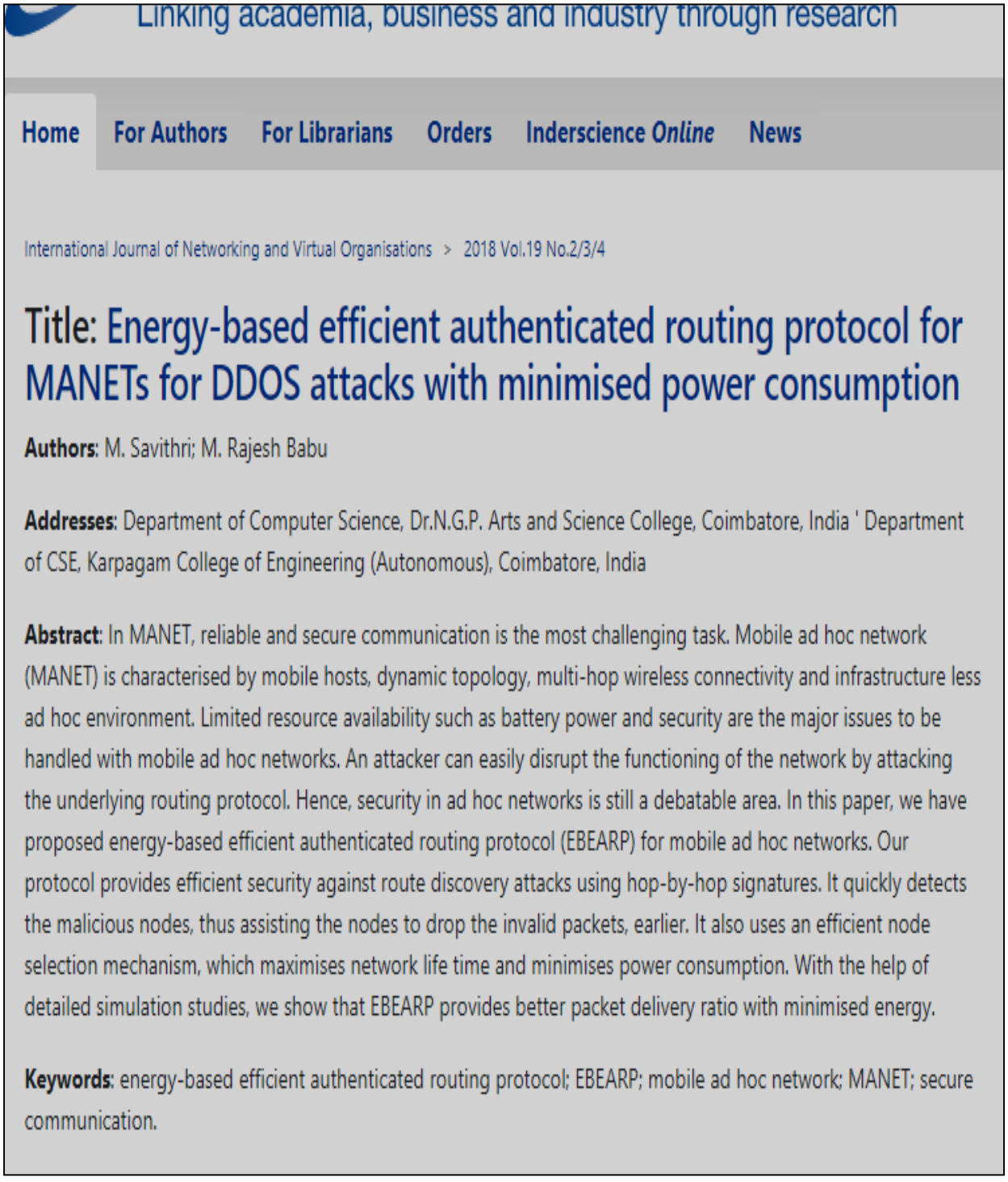
Introduction

Silicon solar cells are currently dominating the photovoltaic (PV) market, due to their high-power conversion efficiency (PCE), excellent charge transport properties, high purity, and environmental stability. Currently, the methods used to manufacture high-efficiency silicon wafer solar cells are expensive in terms of material preparation and fabrication. The possible alternative method to the fabrication of silicon wafer solar cells is bulk heterojunction (BHJ) polymer solar cells.[1,2] Recently, preparation of bulk BHJ photovoltaic devices by different solutions has been reported using p-type conjugated polymers, in combination with n-type polymers[3] or fullerenes.[4] The main drawbacks of BHJ polymer solar cells are high hole layer is formed by the direct interfacial connection between organic materials, such as small molecules and conducting polymers, and inorganic semiconductors such as Nc Si, TiO_2, ZnO, PbS, CdSe, and CdS, as a nanostructured bilayered configuration.[9–14] The inorganic electron acceptor material can provide more advantages to the system while maintaining a low fabrication cost and high electron mobility.

Although many studies devoted to applications of semiconductor nanocrystals in solar cells have been published,[15–17] the improvement in the surface modification procedure and shell composition enhances the functionalities, such as charge transport and electron mobilities, of the solar cells. The physical origin of the impact of the surface modification procedure on charge separation, electron and hole mobilities process is



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Title: Energy-based efficient authenticated routing protocol for MANETs for DDOS attacks with minimised power consumption

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Abstract: In MANET, reliable and secure communication is the most challenging task. Mobile ad hoc network (MANET) is characterised by mobile hosts, dynamic topology, multi-hop wireless connectivity and infrastructure less ad hoc environment. Limited resource availability such as battery power and security are the major issues to be handled with mobile ad hoc networks. An attacker can easily disrupt the functioning of the network by attacking the underlying routing protocol. Hence, security in ad hoc networks is still a debatable area. In this paper, we have proposed energy-based efficient authenticated routing protocol (EBEARP) for mobile ad hoc networks. Our protocol provides efficient security against route discovery attacks using hop-by-hop signatures. It quickly detects the malicious nodes, thus assisting the nodes to drop the invalid packets, earlier. It also uses an efficient node selection mechanism, which maximises network life time and minimises power consumption. With the help of detailed simulation studies, we show that EBEARP provides better packet delivery ratio with minimised energy.

Keywords: energy-based efficient authenticated routing protocol; EBEARP; mobile ad hoc network; MANET; secure communication.

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A Study on Various Cyber-Attacks and their Classification in UAV Assisted Vehicular Ad-Hoc Networks

Authors | Authors and affiliations

N. Vanitha ✉, G. Padmavathi

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Abstract

Unmanned Aerial Vehicles (UAV) systems are autonomous systems that can fly separately or it can be functioned remotely without carrying any individuals. These networks prone to various attacks. The people are benefitted from the current growth of networking and cyber world; however, the rapid development of cyber world has furthermore contributed to immoral practices by persons who are using the technology to utilize others. That type of utilization of cyber world with the intension of accessing unauthorized or protected information, collapsing networks, spying, data and currency theft is called as cyber-attack. There is a tremendous increase in Cyber-attacks in number and complexity greater than the previous era, and also lack of awareness on cyber- attacks which has provided many people/societies/groups reveal the true to these attacks. The main aim of this study is to do a brief study of these cyber-attacks in order to create alertness about the various types of attacks and their action so that suitable

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Electrochemical Investigation of Eco-friendly Chitosan Schiff base for Corrosion Inhibition of Mild Steel in Acid Medium

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Abstract

The corrosion behaviour of mild steel in 1M HCl for the inhibiting action of various concentrations of Chitosan Schiff base was studied using the electrochemical polarization and impedance techniques. The electrochemical studies were carried out in naturally aerated 1M HCl solution containing inhibitors in different concentrations at various temperatures. The data obtained from both the techniques showed that the efficiency of the inhibitor increased with the increase in the inhibitor concentration. The results obtained reveal that Chitosan Schiff base performed effectively as a corrosion inhibitor. The kinetic and thermodynamic parameters for mild steel corrosion and inhibitor adsorption, respectively, were determined and discussed. The mechanism of inhibition was discussed in the light of the chemical structure of the inhibiting compound and their adsorption on steel surface. The adsorption of inhibitor molecules on the metal surface was confirmed by FTIR technique.

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Keywords: Chitosan Schiff base; Mild steel; electrochemical technique; FTIR.

1. Introduction

Metals are remarkable and attractive materials in industrial and structural applications. Metallic structures are destroyed gradually leading to considerable economic losses and safety hazards. Corrosion of metals, a serious environmental issue involves a high risk in control measures since it requires a huge investment of money and utmost safety for effective remedy. Due to the increase in industrial applications of acid solutions, studies on

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Characterization of Ca doped CeO_2 quantum dots and their applications in photocatalytic degradation

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ABSTRACT

We report the synthesis of high quality undoped and Ca doped CeO_2 quantum dots by sol–gel method. Composition, structure and morphology of the quantum dots were analyzed by X-ray diffraction (XRD), Scanning electron microscopy with energy dispersive X-ray analysis (SEM-EDX), High resolution transmission electron microscopy (HR-TEM) and Fourier transform infrared spectroscopy (FTIR). The cubic structure of the CeO_2 quantum dots were determined by XRD. The influence of particle size on structural parameters such as Lattice parameter (a), Dislocation density (δ), Micro strain (ε) and Crystallite size (D) were also determined. SEM-EDX analysis shows the morphology and the presence of elements in the sample and HRTEM micrograph of CeCa5 shows uniform morphology with narrow size distribution. The FTIR analysis confirmed the influence of Ca doping in CeO_2 matrix. The efficiency of photocatalytic degradation of CeO_2 quantum dots increases with increasing of Ca doping concentration. The photodegradation rate of CeCa5 quantum dots (84%) are enhanced in comparison with bare and other doped samples towards the degradation of methylene blue (MB) dye under direct sunlight irradiation. This can be attributed to the improved separation of electron – hole pairs and superior adsorption caused by the presence of Ca.

1. Introduction

The organic pollutants from many industries represent a main source of water contamination. More than 15% of commercially used dyes are released without any treatment. It requires either a chemical or energy intensive processing which leads to further strain on the environment. The azo dyes are mainly used in textile, paper, research laboratories and other industries which are prime examples of environmental contaminants. It can enter in to the human body through skin, and can cause the damage of lung tissues, fast heart rate, and vomiting.

Among the various dyes, MB is one of the most widely used dye in laboratories and industries. It creates several environmental problems by releasing highly toxic molecules into bodies of water. This has a highly stable structure. Therefore MB was chosen as a

Research Article

Evaluation of wound healing property of *Parmelia* sp. against diabetic foot ulcer-causing pathogens

Nisha S. Panicker*

ABSTRACT

Objective: The present study was focussed to evaluate the antimicrobial potential of *Parmelia* sp., specifically targeted toward the pathogens that are responsible for causing diabetic foot ulcers. **Materials and Methods:** The crude extracts of *Parmelia* sp. were obtained by cold extraction process, and the volatile compounds were identified by gas chromatography-mass spectrometry. The antibacterial activity of ethanolic and chloroform extracts of *Parmelia* sp. against the foot ulcer-causing pathogens was evaluated by disc diffusion method. **Results:** Two pathogens were isolated from the swab sample and were identified as *Escherichia coli* and *Staphylococcus aureus* based on microscopy and phenotypic characteristics. The ethanolic extract of *Parmelia* sp. was more effective as compared to chloroform extract and maximum inhibition was observed at a concentration of 200 µl of lichen extract. **Conclusion:** Diabetic foot ulcers are predominantly polymicrobial and multidrug-resistant and are the major reason for non-traumatic lower limb amputation. In this study, the potential of *Parmelia* sp. extract against foot ulcer-causing pathogens has been evaluated. The results from the study prove that *Parmelia* sp. which has been used as a spice possesses constituents with antibacterial activity and can be used in wound healing treatment.

KEY WORDS: Amputation, Diabetic foot ulcers, Non-traumatic, *Parmelia* sp.

INTRODUCTION

India has a rich diversity of lichens represented by about 2450 species. Since ancient times, these have been used as one of the natural drugs and about 700 biologically active components have been structurally identified which were quite unique with respect to those of higher plants.[1-3] Lichens represent a symbiotic association of a fungus with an algal partner and are important constituents of the ecosystem. Lichens produce characteristic secondary metabolites such as aliphatic, aromatic, and terpenic components which have considerable biological activities such

edible source in some areas of Nepal and cultivated in Kashmir hills.[9] *Parmelia* sp. is the thallus, foliaceous, membranous leaf-like horizontally spreading lobes. The thallus is dirty white or grayish-brown nearby 5–10 cm long. *Parmelia* sp. grows in rosettes or irregularly spreads over the substratum giving the appearance of a flower.[10] It has bitter or saline taste. It has folkloric repute of cosmetics for skin bleach and has been prescribed to for the management of diarrhea, dyspepsia, spermatorrhea, dysentery, and wound healing.[11] It has also been reported to possess the antiemetic, analgesic, and astringent activity. Its

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Research Article

BIOPROSPECTING OF MARINE SPONGE (*CALLYSPONGIA DIFFUSA*) FOR ANTIBACTERIAL COMPOUND

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ABSTRACT

Objective: Marine sponges are a rich source of new antimicrobial drugs. The present study was aimed to evaluate the antibacterial activity of the marine sponge (*Callyspongia diffusa*) against human pathogenic bacteria and to analyze the presence of bioactive compounds in the sponge.

Methods: Antibacterial activity of the marine sponge *C. diffuser* was examined using petroleum ether, chloroform, n-butanol, methanol, ethanol, and water as solvents and tested against human pathogenic bacteria such as *Esherichia coli*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus* by agar well diffusion method. Zoochemical analysis was performed to screen for the presence of secondary metabolites. Bioactive compounds were purified by thin layer chromatography (TLC) and were identified by gas chromatography-mass spectrometry (GC-MS) analysis.

Results: The results obtained show that the sponge extracts had significant antibacterial activity against the tested strains. The methanol extract was found to be the most effective and exhibited the highest potency against all pathogens tested. Zoochemical analysis revealed the presence of alkaloids, terpenoids, and sterols. In TLC, spots corresponding to a Rf value of 0.67 were found to possess antibacterial activity against the test bacteria. GC-MS chromatogram showed seven major peaks at retention time of 12.69, 13.81, 24.21, 24.65, 28.01, 28.93, 30.87 minutes. The mass of the compounds and fragments were matched with the National Institute of Standard and Technology (NIST) database for identification of probable compounds present in

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Semiconducting metal oxides for gas sensor applications

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Abstract The present paper reports the synthesis of the semiconducting metal oxides of tin, copper and zinc via a facile hydrothermal route. By the X-ray diffraction technique the as-synthesized materials are investigated and its crystal properties are characterized.The AC conductivity of the metal oxides are determined in the ambient and cigarette smoke environment. The results show, besides the conventional method of testing the sensitivity of the metal oxides, the dielectric analysis is a versatile method for determining potentially suitable candidates for sensing applications.

1 Introduction

of nanoparticles of two or more elements or compounds, having increasing structural sophistication with enhanced properties, triggering interests among researchers over the globe. The field is escalating, with the ability to tailor nanosized materials of heterogeneous chemical species into applications which show potential and promise as it covers multidisciplinary areas of research such as gas sensors [4, 7–10], photocatalysis [8–14], lithium ion batteries [15–17], antibacterial activity [4, 18–20], drug delivery [21], aerospace [22], supercapacitors [23–25], coatings [26, 27] and many more.

Metal oxides constitute a diverse and fascinating class of materials whose properties cover the entire range from