SRINIVAS UNIVERSITY

Private University Established by Karnataka
Govt. ACT No.42 of 2013
Srinivas Nagar, Mukka– 574 146, Surathkal, Mangalore,
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SRINIVAS GROUP
1988 - 2018

INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY

on

18th & 19th October 2019

ABSTRACT BOOK

In Association with
KSCST, Government of Karnataka
CIPAM, Government of India
VTPC- Visvesvaraya Trade Promotion Centre
(Govt of Karnataka Centre for Export Promotion)

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Organised by

College of Engineering & Technology
&
Department of Research & Innovation Council

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INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY

On

18th & 19th October 2019

Chief Guest

Prof. Dr. K. Byrappa

Pro-Vice Chancellor & Dean - Research, Adichunchanagiri University
Former Vice Chancellor, Mangalore University

Prof. Dr. V. P. N. Nampoori

Emeritus Professor & Former Director
International School of Photonics,
Cochin University of Science And Technology, Cochin

Prof. Dr. Kalappa Prashantha

Professor
Center for Teaching, Research and Innovation: Materials and Processes
Institut Mines-Télécom, FRANCE

Mr. Pasand Rao

Assistant Controller of Patents & Designs, Chennai.

Ms. Prabhavathi Rao,

VTPC- Visvesvaraya Trade Promotion Centre
(Govt of Karnataka Centre for Export Promotion)

Mr. Vivek Anand Sagar,

IPR Attorney, KSCST

SRINIVAS UNIVERSITY - VISION AND MISSION

VISION

To be a trendsetter among universities and build students who emerge as leaders with competence, conscience and compassion by empowering them with sound education and high standards of ethical and professional behaviour enabling them to build and promote a more humane, just and sustainable world for future generations

MISSION

Our mission is to provide an exceptional learning environment where students can develop and enhance their leadership and teamwork skills, creative and intellectual powers and passion for learning by providing an uncompromising standard of excellence in teaching; embodying the spirit of excellence to educate the citizen-leaders of society with distinction

Note: All Papers presented in the conference will be published in the proceeding book after review with ISBN 978-81-941 751-3-1

Resource Persons

Prof. Dr. K. Byrappa
Pro-Vice Chancellor & Dean, Research, Adichunchanagiri University
Former Vice Chancellor, Mangalore University

Prof. Dr. V. P. N. Nampoori
Emeritus Professor & Former Director
International School of Photonics,
Cochin University of Science and Technology, Cochin

Prof. Dr. Kalappa Prashantha
Professor
Center for Teaching, Research and Innovation: Materials and Processes
Institute Mines-Telecom, FRANCE

Prof. Dr. A.R. Phani
Managing Director
Innovative Nano & Micro Technologies Private Limited
And Nuvent Paints Private Limited (R&D Lab Recognized by DSIR, New Delhi)

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Ms. Prabhavathi Rao

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Associate Scientist, BASF,Katipalla, Mangalore

Prof. Dr. Kiran B Manjappa
Professor, Department of Chemistry,
Tunghai University,
Taichung, Taiwan 40704

Prof. Dr P. S. Aithal
Vice Chancellor – Srinivas University

PROGRAMME SCHEDULE

Day 1 – 18.10.2019

Time	*Session*
9.00 am – 10.00 am	**Registration**
Inaugural Session **10.00 am- 11.15 am** **Dignitaries**	• **Dr.K.Byrappa** • **Dr.V. P. N. Nampoori** • **Dr. Prashnatha** • **Mr.Prasad Rao** • **Ms.Prabhavathi Rao** • **Vivek Anand Sagar – KSCST** • **Dr. P S Aithal** • **Dr.Anil Kumar** • **Dr . A Srinivas Rao** • **Presidential Remark – CA A Raghavendra Rao**
11.15 am to 11.30 am	**Group photo and Tea break**
11.30 am - 12.15 pm **Session I** **Key note spaker**	**Dr.Kalappa Prashantha** Professor Center for Teaching, Research and Innovation: Materials and Processes Institut Mines-Télécom 941, rue Charles Bourseul B.P.10838-59508 Douai Cedex, FRANCE **Title of the talk: Smart Polymer Blends and Multifunctional Composites for Advanced Application**
12.15 pm – 1.00 pm **Session II**	**Dr. V. P. N. Nampoori** Emeritus Professor & Former Director International School of Photonics, Cochin University of Science And Technology, Cochin 682022, Kerala, India. **Title of the talk: Nanophotonics- An Overview**
01. 00 pm – 2.00 pm	**Lunch Break**
2.00 pm – 2.45 pm **Session III**	**Dr.K.Byrappa,Ph.D** Fellow, World Academy of Ceramics, Italy Fellow, Asia Pacific Academy of Materials Secretary General, Asia Pacific Academy of Materials

	Pro-Vice Chancellor & Dean, Research, Adichunchanagiri University Former Vice Chancellor, Mangalore University Visiting Professor, University of Mysore **Title of the talk: Molecular Engineering of Multi-Functional Metal Oxides Heterostructures – A Transdisciplinary Approach**
2.45 pm – 4.45 pm Session IV	**Title: Nanotechnology and Patenting:- National & International perspective and Government Initiative.** **Mr Vivek Anand Sagar, IPR Attorney, KSCST** **Mr.Pasand Rao, Assistant Controller of Patent & Designs, Indian Patent Office, Chennai** **Ms. Brinda Varma, IPR Attorney, KSCST** **Ms.Ekta Prasad, IPR Attorney, KSCST** **Ms.Prabhavathi Rao, VTPC- Visvesvaraya Trade Promotion Centre (Govt of Karnataka Centre for Export Promotion)**
4.45 pm – 5.30 pm	**Poster Presentation with High Tea**

Day 2 – 19.10.2019

Time	Session
9.00 am – 9.30 am session 1	**Dr. Manoj Krishna K Narayan** Associate Scientist, BASF,Katipalla, Mangalore **Title of the talk : 'Enhancing Fuel Cell Performance with Nano Catalysts'.**
9.30 am - 10.00 am Session II	**Dr.Kiran B Manjappa** Professor Department of Chemistry, Tunghai University, Taichung, Taiwan 40704 **Title of the talk : Coumarin Based Functional Molecules**
10.00 am – 10.45 am	**Dr. A.R. Phani** Managing DirectorInnovative Nano & Micro Technologies Private Limited And Nuvent Paints Private Limited (R&D Lab Recognized by DSIR, New Delhi) **Title of the talk: "Commercialization of Nanomaterials for various Industrial Applications"**
10.45- 11.00 am	**Tea Break**
11.00 am – 11.30 am	**Prof. Dr P S Aithal** Vice Chancellor – Srinivas University **Title of the Talk: Technology Unification: How Different Technologies Work Together For Achieving Common Goal**

11.30 am – 1.00 pm	**Oral Presentation**
1.00 pm – 2.00 pm	**Lunch Break**
2.00 pm – 3.00 pm	**Valedictory Session** **Feedback and Certificate distribution**

KEY NOTE SPEAKER

SMART POLYMER BLENDS AND MULTIFUNCTIONAL COMPOSITES FOR ADVANCED APPLICATIONS

K.Prashantha
Center for Teaching, Research and Innovation:Materials and Processes
Institut Mines-Télécom
941, rue Charles Bourseul
B.P.10838-59508 Douai Cedex, FRANCE

ABSTRACT

Recent developments in polymeric materials, blends and their nanocomposites systems have shown that these novel materials can improve design of newer materials for various applications from biomedical to energy harvesting systems. Improvements in the mechanical properties, structural stability and multi-functionality are the key factors that dictate the applicability of polymeric materials. In this presentation, we will summarize the research results obtained at IMT Lille- Douai, Department of Polymers, composites and mechanical Engineering; especially on bio foams, shape memory and piezoelectric polymers, blends and nanocomposites fabricated via melt extrusion method. This talk highlights the different processing approaches to prepare different types of blends based on polyamide, polyamide and polyurethanes in order to understand the morphological, interface, thermomechanical, piezoelectric and (thermochromic)shape recovery behaviour under large strain, such as integration of additional functions and novel blending routes toward permanent and temporary net points. This talk highlights the different approaches to understand the thermomechanical and shape recovery behaviour under large strain, such as integration of additional functions and novel blending routes toward permanent and temporary net points. Multiphase polymeric systems and their systems illustrate that tunable properties can be constructed by simple blending routes to achieve higher shape recovery under large strain, high ductility and improved piezoelectric properties. Future developments in additive manufacturing (3D Printing) of multifunctional and multistimuli-sensitive polymeric systems will also be discussed.

INVITED SPEAKER

MOLECULAR ENGINEERING OF MULTI-FUNCTIONAL METAL OXIDES HETEROSTRUCTURES - A TRANSDISCIPLINARY APPROACH

K. Byrappa[1,2]*

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[2]Adichunchanagiri University, B.G. Nagar, NH-75, Nagamangala Tq., Mandya District, Karnataka 571448, India

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ABSTRACT

Metal oxides form an important group of frontier materials with unique multi-functional physical, chemical and biological properties. Herein, unique strategies are proposed to tune the properties of metal oxide and hybrid heterostructure metal oxide nanostructures using a facile hydrothermal solution and multi-energy hydrothermal methods. I*n situ* surface modification using a variety of surfactants – both organic and natural plant extracts has been employed to achieve a desired surface chemistry for the nanocomposites. There are some serious drawbacks associated with the higher rates of charge carrier–recombination, which facilitates the absorption of only a small percentage of the solar spectrum in the UV region owing to the wide bandgap, which restricts their photocatalytic applications under the visible-light illumination, thus posing a major challenge to researchers for the effective utilization of metal oxides.Therefore, the heterostructure nanocomposites have superior properties for photocatalytic and electrocatalytic applications due to efficient separation of photo-induced electrons and holes of the photocatalysts, caused by the vectorial transfer of electrons and holes. Heterostructure nanocomposite systems like ZnO-MnO_2; ZnO-CeO-Bi_2O_3; ZnO-CeO-CsO; Al/ZnO-GO; ZnO- Co_3O_4; ZnO-NiO; ZnO-GO; CeO_2-GO; ZnS-GO and Fe_3O_4-GO and ZnO-In_2O_3 have been processed with controlled structure and morphology. MoS_2-Bi_2S_3-TiO_2 heterostructure nanocomposites illustrate higher ability to split water to H_2 and O_2 under simulated sunlight irradiation without any sacrificial agents or co-catalysts of excellent photostability, better photocatalytic activity under sunlight for the degradation of phenol. Similarly Ag-ZnO heterostructure hybrid nanocomposites exhibit higher antimicrobial activity, antioxidant activity with less cytotoxicity and efficient photocatalytic properties. An attempt has been made to generate oxygen vacancies through self doping in these metal oxides, which is an innovative concept in metal oxides research. These studies introduce fundamental insights into the ***molecular engineering of metal oxides and heterostructure metal oxides through one step facile solution processing to fine tuning of properties for environment, energy and health applications.***

INVITED SPEAKER

NANOPHOTONICS- AN OVERVIEW

V P N Nampoori
International School of Photonics, Cochin University of Science and Technology
Cochin 682022

ABSTRACT

Nano science and nano technology have revolutionized the field of materials science both in our basic understanding of light – matter interaction leading to a paradigm shift in developing new technologies which influenced varied branches like medicine, sensor technology , archaeology, health sciences and textile technology. The present talk aims at describing applications of nano materials in realizing photonic band gap materials and media for random lasers

INVITED SPEAKER

NANOSTRUCTURED MATERIALS BY COST EFFECTIVE TECHNIQUES FOR INDUSTRIAL APPLICATIONS

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Innovative Nano & Micro Technologies Private Limited, Bangalore, Karnataka State, India
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ABSTRACT

The nanotechnology is considered to have great potential for the development of new innovative materials with an environmental advantage, the so-called ‘eco-innovation’ materials. However, it is necessary to have in-depth understanding in this area, in order to facilitate and not at least to accelerate implementation of nanocoatings or nanomaterials in different end products. The nanotechnology is still in the early development stage, where great potentials are discovered, but at the same time is difficult to get support from other scientists and materials developers and heading forward to actual product innovation projects. Nanostructured materials (in particular Inorg-polymer, org-polymer, hybrid coatings) are expected to create radical changes in diverse fields. From electronics, by providing materials for the next generation of computer chips; to energy technologies, where novel materials may have a critical impact on new types of solar cells, rechargeable batteries and energy storage systems. Potential applications for micro and nanostructured materials include pharmaceuticals, cosmetics, medical diagnostics, catalysts and supports, membranes and filters, batteries and fuel cells, hydrogen storage systems, electronic, magnetic and optical devices, flat panel displays, biomaterials, drug delivery systems, structural materials and

protective coatings. To meet the requirements, the sol-gel process represents a flexible chemical route to synthesize various high performance nanostructured ceramic materials with controlled internal morphology and chemistry. The sol-gel process is a solution-based technique, where the material structure is created through chemical reactions in the liquid state, giving the high flexibility of the process for easy application. In the present work it will be demonstrated that sol-gel technology can alone bring all the nanomaterials (nanostructured thin films, nanostructurted coatings, nanocomposites, inorg-polymer hybrid coatings, nanostructured conducting polymers, aerogels, hydrogels, xerogels, nanoparticles, nanofibers, nanospheres) to apply to various industrial applications that include Energy, Transport, Health, Food, Life sciences, Pharmaceutical, Biotechnologhy, Bio-medical, Telecommunications, and Electronics sectors.

Keywords: Sol-gel process, nanostructures, thin films, nanoparticles, nanospheres, nanofibers, hydro-oleophobic, microwave irradiation, electrospinning

TECHNOLOGY UNIFICATION: HOW DIFFERENT TECHNOLOGIES WORK TOGETHER FOR ACHIEVING COMMON GOAL

P. S. Aithal
Vice Chancellor, Srinivas University, Mangalore – 575 001, India
E-mail : psaithal@gmail.com

ABSTRACT

Technology is an application of science and used to solve many complicated challenges in society to make human life comfortable and happy. Certain technologies have grown and expanded their branches to many areas and sectors of practice in such a way that they have been designated as General-Purpose Technologies. Such general-purpose technologies are identified and used in many industries to do business and to solve or simplify the problems of industries. During the last few years, it is observed that out of many general-purpose technologies, two technologies have shown accelerated growth and gave birth to many underlying sub-technologies: (1) Information Communication and Computation Technology (ICCT), and (2) Nanotechnology (NT). These two technologies are further identified as "Universal Technologies" due to their potential capability of solving problems related to basic needs, advanced wants, and dreamy desires of human beings in society. ICCT has opened up the possibility of ubiquitous solutions to many problems by offering mobility, stability, and sustainability along with its complementary technology of nanotechnology. In this paper, we have analysed and interpreted the capability of ICCT underlying technologies and nanotechnology underlying technologies in solving issues pertaining to basic needs, advanced wants, and dreamy desires of human beings in society. The paper also discusses how these universal technologies can unified to further strengthen their abilities in solving the problems of mankind towards moving to a point of technological singularity.

Keywords: Universal technologies, ICCT, Nanotechnology, Technological singularity, Unification of technologies

COUMARIN BASED FUNCTIONAL MOLECULES

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ABSTRACT

Multi-component reactions (MCR's) are fascinating tool through which library of new molecular systems can be prepared in one-pot manner. In the present talk, MCR involving coumarin moiety is presented. Synthesised coumarin based molecules were tested for their functional properties. Scope of the newly developed MCR involving coumarins allows to fine tune the molecular-skeleton systematically. Using this robust methodology, functional properties like-photochromism, piezochromism, photosentivity and gelator propertis of prepared compounds were studied. The talk comprises the idea behind the design rationale, charecterization and method to explore above mentioned functional properties. We are confident that, further exploring the MCR will certainly leads to the designing of coumarin-based smart-molecules.

PANEL DISCUSSION

NANOTECHNOLOGY AND PATENTING: NATIONAL AND INTERNATIONAL PERSPECTIVE AND GOVERNMENT INITIATIVE.

Mr. Pasand Rao
Assistant Controller of Patent & Designs, Indian Patent Office, Chennai
Mr. Vivek Anand Sagar
IPR Attorney, KSCST
Ms. Brinda Varma
IPR Attorney, KSCST
Ms. Ekta Prasad
IPR Attorney, KSCST
Ms. Prabhavathi Rao
VTPC- Visvesvaraya Trade Promotion Centre
(Govt of Karnataka Centre for Export Promotion)

This panel discussion would cover on the patentability criteria and Non Patentability subject matter under section 3 of the Patent Act 1970 in India by the Representative of Indian Patent Office. Understanding on the procedure of patenting in India and what is looked from the patent office perspective with respect to Nanotechnology. Further the panel would through light on the National and International Perspective of patenting of Nanotechnologies its possession, issues and challenges. Later it would cover on the Government Initiative and policy to promote and protect nanotechnology by the tools of Intellectual Property with special focus on the Patent and way forward.

ORAL PRESENTATION - CONTENTS

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OP 2	Yathavan Subramanian	Structural, Optical and Photocatalytic Properties of $MnFe_2O_3/Bi_2S_3$ Nanocomposites
OP 3	Nagaraj S Naik	Fabrication of novel poly (ionic liquid) based diffusion dialysis membrane for rapid acid recovery
OP 4	Aisha Siddiqa	Cobalt Nickel Sulphide: An Efficient Pseudocapacitive Material for High Performance Supercapacitor Application
OP 5	Pavitra V J	Binary metal oxide SnO 2 -CuO nanocomposite for Li-ion battery applications
OP 6	Arjun G Kalkhambkar	Development of Furfuraldehyde Derivatives as Nano Corrosion Inhibitors for Mild Steel in Hydrochloric Acid Medium.
OP 7	Vasu Namala & Dr S. Anbu Karuppusamy	A Survey On The Methodologies Used For Efficient Retrieval Of Videos

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25.	Cleaning The Environment Using Nanotechnology – A Review Based Machine Design
26.	Graphitic Carbon Nitride (G-C_3n_4) Nanosheetstemptedmixed Matrix Membrane For Removal Of Toxic Metal Ions From Water
27.	Adsorption Properties Of Bio-Adsorbent On Various Dyes And Heavy Metal Ions In Wastewater
28.	An Explorative Research On Production And Use Of Nanobots In Healthcare Industry Sectors
29.	Commercialization Of Nanotechnology Products And Services – Top Down And Bottom Up Model
30.	How To Achieve Singularity Using Nanobiotechnology ? – A Predictive Analysis
31.	Optimizing Electrical Charge Storage In Nanotechnology Based Devices For Electric Vehicles
32.	Patent Analysis On Lithium Ion Battery Comprising Nanomaterials
33.	Nanotechnology In Pharmacology & Pharmaceutical Research – Opportunities, Challenges, & Research Agendas
34.	Development Of Ni-V_2O_5 Nanocomposites
35.	Development Of Ni–Tio_2-CNT Nanocomposites
36.	Generation Of Ni–Nb_2o5 Nanocomposites
37.	Electrochemical And Adsorption Studies Of Ritonovir For Mild Steel In Acidic Medium.
38.	Zn-Fe Alloy Nano Structure Coatings
39.	Synthesis Of Cobalt Ferrite Nanoparticles
40.	Synthesis, Anti-Inflammatory Activity And In-Silico Study Of Some Novel Morpholine Based Carboxamides
41.	A Study On Cyber Stalking
42.	A Study On Recommender Systems
43.	Recommender Systems In Big Data Environment
44.	A Review On Edge Computing
45.	Face Recognition Using Deep Learning
46.	Fog Computing – A Review
47.	Object Detection Using Deep Learning
48.	Onion Routers
49.	A Study On Fingerprint Recognition Systems
50.	Applications Of Support Vector Machines

51.	Applications Of Cloud Computing In Healthcare Sector
52.	Securing Mobile Communications Using Public Key Cryptography
53.	Blockchain Technology – A Review
54.	Monitoring The Cloud Applications
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56.	Eye Tracking System In The Head Mounted Display In Fighter Helmet
57.	Preparation And Evaluation Of Abrasion Resistance And Compressive Strength Of Al/Sic/Graphite Based Metal Matrix Composites
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59.	Development Of Nano Organic Layer On Zinc Surface For Corrosion Inhibition In Acidic Media
60.	Growth, Linear And Nonlinear Optical, Electrical, Mechanical And Dielectric Properties Of Zinc Sulphate Doped L-Alanine Nano Single Crystal For Optoelectronic Applications
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64.	Fabrication Of Cost-Effective Interdigitated Electrode Using Copper Clad With Chromium Oxide &Rgo Nanocomposite As A Gas Sensing Element
65.	Synthesis And Characterization Of Zno Nano Metal Oxide For Effluent Water Treatment
66.	One Step Green Solution Phase Synthesis Of Copper Nanofluids For Enhanced Thermal Conductivity And Stability
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81.	Microwave Properties Of Gamma Irradiated Mg-Zn Ferrite.
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88.	Biocompatible Razma Seeds Assisted Cuo Nanoparticles For Antibacterial And Photocatalytic Degradation Studies
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91.	Monitoring Of Agricultural Crops Using Wireless Sensor Network Technology
92.	Status Of Ambient Air Quality In Chitradurga
93.	Dual Intake System In Two-Stroke Engine
94.	Effect Of Burr Height In Drilling Low Carbon Steels For Different Drill Point Angles
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98.	Synthesis And Characterization Of N-(4-Methoxyphenyl)-Nmethyl-3-Phenylpropiolamides
99.	Synthesis And Characterization Of P-(4-Substitutedphenyl)-Acetophenone By Suzuki Coupling Reaction
100.	Synthesis And Characterization Of Triphenylene Intermediates For Discotic Liquid Crystals
101.	Synthesis Of Hantszch Ester And Its Application For The Synthesis Of Dibenzylamine
102.	Synthesis And Characterization Of Azo-Functionalised Liquid Crystalline Compounds
103.	Synthesis And Antimicrobial Evaluation Of Novel 4-Amino-6-(1,3,4-Oxadiazolo/1,3,4-Thiadiazolo)-Pyrimidine Derivatives
104.	A Review Of Tracking Approaches For Noisy Targets

105.	Design Optimization Of Power Manipulator Gripper For Maximum Grip Force
106.	Iron Doped Aluminum Oxide Based Mixed Matrix Membrane For Antifouling Study
107.	Cobalt Nickel Sulphide: An Efficient Pseudocapacitive Material For High Performance Supercapacitor Application
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111.	Inventorization Of Water Quality Of Arkavathi River –An Analysis
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114.	Thermoelectric Refrigeration System.

EFFECT OF MANGANESE ON Co-Mn/CNT BIMETALLIC CATALYST PERFORMANCE IN FISCHER-TROPSCH REACTION

Omid Akbarzadeh

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ABSTRACT

Cobalt (Co) supported by a strong electrostatic adsorption (SEA) method using carbon nanotubes (CNT) catalyst. To promote activity and selectivity and find the optimum loading percentage and its effect on catalyst performance, manganese (Mn) has been added to the Co/CNT catalyst. Samples were characterized by a scanning electron microscope (SEM-EDX), transmission electron microscope (TEM), hydrogen thermal program reduction (H2-TPR), Zeta potential, Brunauer–Emmett–Teller (BET), X-ray diffraction (XRD), X-ray spectroscopy (XPS) TEM images showed an intake of metal particles and they were highly dispersed with a narrow particle size distribution of 6-8 nm to the external and internal CNT support. H2-TPR showed a lower temperature reduction with Mn at 420 °C for FTS reaction. Co-Mn/CNT performance test in Fischer-Tropsch synthesis (FTS) was carried out at a temperature of 240 °C in a fixed-bed micro-reactor, a pressure of 2.0 MPa. The addition of manganese resulted in a lower methane selectivity and a higher C5+ product with an optimum percentage of 5 percent of manganese. With a CO conversion of 86.6% and a C5+ selectivity of 81.5%, which was higher than the catalysts obtained using only Co on pretreated CNT.

Keywords: CNTs; thermal treatment; Cobalt; Fischer-Tropsch; Catalyst; Acid treatment.

STRUCTURAL,OPTICAL AND PHOTOCATALYTIC PROPERTIES OF $MNFE_2O_3/BI_2S_3$NANOCOMPOSITES

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ABSTRACT

Virgin $MnFe_2O_3$, Bi_2S_3, and $MnFe_2O_3/Bi_2S_3$ heterostructure nanocomposites were successfully prepared by a single step and facile sol-gel technique. Compared with the pure $MnFe_2O_3$ and Bi_2S_3photocatalysts, the inclusion of Bi_2S_3 in the $MnFe_2O_3$ makes its absorption

area to absorb much more visible light, and reduces the recombination rate of photogenerated carrier. As-obtained $MnFe_2O_3/Bi_2S_3$ nanorods exhibit higher photocatalytic activity in both the degradation of Methylene Blue (MB) and H_2 evolution from water under visible-light irradiation. The $MnFe_2O_3/Bi_2S_3$ nanorods exhibited about 3.5 times and 1.5 times higher H_2 evolution than that of pure $MnFe_2O_3$ and Bi_2S_3, samples, respectively. Similarly, for photodegradation of methylene blue using $MnFe_2O_3/Bi_2S_3$ nanorods was to be found to have been enhanced to 98%. The other significant results have been discussed in detail.

Keywords: Methylene Blue, Dye degradation, Hydrogen Generation, Nanocomposites.

IMPLEMENTATION OF HUMAN EYE PUPIL DETECTION SYSTEM USING INTENSITY LABELING ALGORITHM

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ABSTRACT

Pupil detection techniques are useful for eye diagnosis equipments and eye diseases monitoring devices. In general, it is difficult to detect pupils without illumination. However, if using near-infrared illuminations, pupil detection becomes dramatically robust. Many previous works have the capability of determining the locations of the human eyes. My aim is to design a real-time, robust, eye pupil detection system with human eye movement indication property using the movements of eye pupil. The most crucial part in eye detection system is to identify the eye location. This system is focus on major parts of preprocessing phase which are image enhancement using median filtering, segmentation using threshold process and morphology to detect pupil shape. Finally, Intensity Labeling algorithm done for an exact eye pupil. Real time FPGA implementation is done by Altera Quartus II software with cyclone IV FPGA.

Keywords *: Pupil tracking, Threshold, Intensity Labeling algorithm, Cyclone IV FPGA*

A SURVEY ON THE METHODOLOGIES USED FOR EFFICIENT RETRIEVAL OF VIDEOS

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ABSTRACT

There was an enormous development in the techniques used for retrieval of multimedia content accumulated across the network repositories. Most of the people upload their videos in the well-known websites like YouTube, Meta cafe, Google Video etc. The indexing and categorization of these sorts of data requires an efficient algorithm to reduce cost, time and improve its effectiveness. Many of the categorization methods apply manual tagging. In this paper, we present a survey on the techniques used in retrieval of videos and also we propose to develop an efficient methodology for efficient retrieval. Key feature extraction and template matching are the major role in the proposed system.

Keywords: Multimedia, retrieval, categorization, indexing, key feature, template matching.

SIMULATION OF A NANO ROBOT FOR MEDICAL APPLICATIONS USING THE CONCEPT OF NANOTECHNOLOGY

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ABSTRACT

A brief review of the nanorobots that are currently used in the biomedical engineering to cure various types of diseases are being presented. In the context, we are carrying out a literature survey for the treatment of cancer using the nano-technology concept. The way we have picked is the union of nanotechnology and medicine. The mix of nanotechnology into medication is probably going to get some new difficulties restorative treatment. Nanorobot is a superb vision of medicine in future. The most exceptional nanomedicine includes the utilization of nanorobots as small scale specialists. Advancement in nanotechnology may allow us to build artificial red blood cells called Respirocytes capable of carrying oxygen and carbon dioxide molecules (i.e., functions of natural blood cells). Respirocytes are nanorobots, small mechanical gadgets intended to work on the atomic level. Respirocytes can give a brief substitution to characteristic platelets in the instance of a crisis. Subsequently respirocytes will truly change the treatment of coronary illness. We can imagine a day when you could infuse billions of these nanorobots that would skim around in your body. A standout amongst the most sensible and almost doable accomplishments is the cure for growth which is one of the primary centers of this work. Nanorobots could carry and deliver large amounts of anti-cancer drugs into cancerous cells without harming healthy cells, reducing the side effects related to current therapies. These nanorobots will have the capacity to repair tissues, clean veins and aviation routes, this paper is the UG credit seminar work of the undergraduate student that was undertaken by my PG & Ph.D. students & just provides a brief review of the applications of the nanorobots that could be used in the medicine for the curing of the cancer treatment and is just a review paper, which serves as a basis for all the students, faculties as a base for carrying out the research in this exciting field of nanorobotics. At the end, once the review is over, we are presenting a simulation which we had developed in nanohive simulation tool for bio-medical engineering applications.

General Terms;Nanorobots, Medicine

Keywords:Cancer, Treatment, Coronary, Artery

MERCURY REMOVAL BY POROUS SULFUR COPOLYMERS: ADSORPTION ISOTHERM AND KINETICS STUDIES

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ABSTRACT

Mercury is one of the most toxic, harmful element in water that severely affects human health and living creatures. Many traditional treatment methods, as well as advanced technologies were developed to capture mercury from wastewater. In this study, large abundant available sulfur used to prepare micro and macroporous sulfur foam via inverse vulcanization technique and utilized to remove trace amounts of mercury from wastewater. Adsorption of mercury ions onto prepared porous sulfur foam was studied in detail using different isotherm and kinetics models. The adsorption kinetics followed a pseudo-second-order rate equation. Among two-parameter isotherm models, experimental data fitted best to the Langmuir model and the sulfur copolymer with maximum surface area and porosity showed the maximum adsorption capacity of 371.33 $\mu g.g^{-1}$, whereas, among three-parameter isotherm models Sips and Toth isotherm models were fitted most suitably. Adsorption isotherm and kinetics studies predicted that the mercury ions were adsorbed onto various sulfur copolymers *via* both physical and chemical adsorption and their adsorption capacity was highly influenced by the porosity. Metal ion diffusion mechanism was found to be a combination of both intraparticle and diffusion mechanisms. Hence, the modification in the porosity of sulfur copolymers significantly improved the adsorption capacity and it can be used effectively to remove mercury ions from wastewater.

Keywords: Sulfur, Inverse vulcanization, Foams, Porous, Moulding; Mercury adsorption

DEVELOPMENT OF FURFURALDEHYDE DERIVATIVES AS NANO CORROSION INHIBITORS FOR MILD STEEL IN HYDROCHLORIC ACID MEDIUM.

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ABSTRACT

Furfuraldehyde derivatives are prepared by the condensation reaction between furfuraldehyde with urea (CFU) &furfuraldehyde with thiourea (CFTU). The products were subjected to corrosion inhibition studies on mild steel in presence of hydrochloric acid solution using chemical and electrochemical methods. Results showed that the prepared compounds control the corrosion of mild steel in hydrochloric acid solution. The CFTU showed better corrosion inhibition than CFU. Both these compounds possessed good interaction on the metal surface and formed barrier between metal and solution interface. The corrosion current density, corrosion potential, Tafel slopes and percentage inhibition efficiency were calculated. Thermodynamic parameters such as heat of adsorption, free energy of adsorption and entropy of adsorption were calculated and interpreted. The synthesised compounds control both anodic and cathodic reactions and acts as mixed type of inhibitors. The corrosion control can be explained on the basis of adsorption of inhibitors on the metal surface. Scanning electron microscopic photo immagesreveled that nano level molecular adsorption takes place on the metal surface and control the corrosion to a greater extent.

Keywords: Corrosion: corrosion inhibitors: corrosion rate: furfuraldehyde derivatives: percentage inhibition efficiency.

SYNTHESIS CHARACTERIZATION & STRUCTURAL STUDIES OF (Z)-1-(4-METHOXYPHENYL)-N-(4H-1,2,4-TRIAZOL-4-YL)METHANIMINE

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ABSTRACT

Schiff Bases prepared from Triazole derivatives have been the focus of attention in recent years in view of their interesting physicochemical properties and broad range of applications in several chemical disciplines. Schiff's bases of aromatic aldehydes having an effective conjugated system are more stable and an aliphatic aldehydes are relatively unstable and readily polymerizable. Schiff bases obtained from aromatic aldehydes and aromatic amines have a shown number of applications in many fields including pharmaceutical, life sciences and chemical science including inorganic and analytical chemistry. Some Schiff Bases derivatives were reported to possess antimicrobial, anti-inflamatory. Moreover, Schiff Bases are also known to have biological activities such as antifungal, antitumor. A new Schiff base of 4-amino-4H-1,2,4-triazole with anisaldehyde was synthesized. Synthesized compound (Z)-1-(4-methoxyphenyl)-N-(4H-1,2,4-triazol-4-yl)methanimineis crystallized in triclinic crystal system with P-1 space group, Further, the Hirshfeld surface analysis for visually analyzing intermolecular interaction in crystal structures employing molecular surface contours and fingerprint plots .

Key words: Triazole, Schiff Bases, Hirshfeld surface and biological activity

OPTICAL PROPERTIES OF ZINC- INCORPORATED CHROMIUM FERRITE NANO CRYSTALS -BY CO PRECIPITATION METHOD

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ABSTRACT

Ferrite are special class of ceramic materials and are continues to be interesting material in the field of technology. These exhibit attractive structural, electrical, magnetic and optical properties at nano level. Substitution of divalent metal ion enhances their physical properties so; we added nonmagnetic dopants Zinc nanocrystals. Chromium zinc ferrite Cr_1-xZnxFe_2O_4 ($0 \leq x \leq 1$) systems was prepared by co precipitation mthod, and characterized how relevant properties of the samples are modified accordingly. Basically, these dopings cause a rearrangement of Fe^{+3} ions into the two pre existing octahedral and tetrahedral sites. The structural confirmation was done by XRD analysis. Particle size was calculated by Debye Scherer formula. DC electrical conductivity was studied at room temperature. The influences of Zn substitutions are investigated on the optical properties of nickel ferrite nanocrystals by photoluminescence measurement at room temperature.

Keywords: Ferrites nano particle, Zinc dopants, electrical and magnetic properties

ELECTRICAL AND OPTICAL PROPERTIES OF SNO_2 NANOPARTICLES SYNTHESIZED BY AN ECO FRIENDLY APPROACH.

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ABSTRACT

Synthesis of metal oxide nanoparticles using green fuels is a promising alternative to traditional chemical method. In this paper we report the synthesis of highly stable tin oxide nanoparticles by using both chemical and natural fuel by simple solution combustion method. Here we have used citric acid as a standard chemical based fuel and lemon juice as bio fuel. The synthesized

nanoparticles have been confirmed by UV-Vis absorption spectroscopy, X-ray diffraction (XRD), scanning electron microscope (SEM) and energy dispersive X-ray studies (EDAX). UV-Vis spectrum of the formed sample shows an absorption peak at around 343nm and 338nm for citric acid and lemon juice based fuels respectively. The optical band gap energy E_g using Tauc's plot are found to be 3.62eV and 3.67eV. respectively. XRD studies reveals that synthesized samples have rutile tetragonal structure with an average crystallite size of 21nm and 17nm for citric acid and lemon juice respectively. SEM reveals the quasi spherical morphology and nano ranged size of SnO_2 particles. EDAX study confirms the formation of highly pure SnO_2 NP's even in the presence of natural fuel. DC electrical conductivity of the samples was studied in the temperature range 295K-615K. From the results obtained it is suggested that the large scale production of highly stable and pure SnO_2 NPs is possible through this eco-friendly method and this could be used effectively in electrical and optical devices compared to traditional chemical approach.

USE OF NANOSIZED CORROSION INHIBITORS FOR CORROSION OF MILD STEEL IN ACIDIC CORROSIVE MEDIA

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ABSTRACT

The use of nanomaterials as corrosion inhibitors has acquired a great importance because of increased corrosion inhibition efficiency with respect to increased surface volume ratio. The corrosion protection of mild steel in 1M HCl solution using nano based corrosion inhibitor material was investigated by chemical method such as weight loss measurement and electrochemical methods such as potentiodynamic polarization and electrochemical impedance measurements. The experimental results indicated that the introduction of the corrosion inhibitor into acidic solution has retarded the corrosion tendency of mild steel. The inhibition efficiency was found to increase with increase in the inhibitor concentration and temperature. Results from Polarization studies indicated the mixed type behaviour of the inhibitor on mild steel. It was revealed that the degree of inhibition depends on many factors such as nature and

physical state of the metal surface, nature of the corrosive medium, molecular structure of the inhibitor compound and molecular electronic parameters. EIS studies suggested that the rate of corrosion is controlled by charge transfer process. The mode of adsorption obeyed the Langmuir adsorption isotherm and suggested the inhibition effect is due to the function of inhibitor molecule that blocks the active sites on metal surface. The effect of temperature and the adsorption mechanism on inhibition action of the inhibitor was also examined by calculating various activation and thermodynamic parameters.The free energy of adsorption values was found to be greater than -20Kj/mol, indicating the mixed mode of physisorption and chemisorption. Surface analysis was examined by Scanning electron microscope (SEM). Surface analysis indicated that the mild steel surface is protected from acidic solution in the presence of nano corrosion inhibitor. The presence of various hetero atoms which involve in adsorption mechanism was examined by electron dispersive X-ray spectroscopy (EDS) and Fourier transform–infrared (FT-IR) studies. The study helps in understanding the corrosion inhibition mechanism of nano based materials for mild steel in acidic environment.

FABRICATION OF NOVEL POLY (IONIC LIQUID) BASED DIFFUSION DIALYSIS MEMBRANE FOR RAPID ACID RECOVERY

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ABSTRACT

Anion exchange membrane with quick acid permeation and elevated salt retention is urgently required to boost the process effectiveness of acid recovery from multiple industrial processes through diffusion dialysis (DD), thereby significantly reducing their energy consumption and environmental impact. In this work, we have fabricated a novel membrane in one step an eco-friendly process. Free radical polymerization was successfully done with the photo initiator in sunlight to achieve the desired novel polymeric membrane. The definite monomers in membrane matrix play a crucial role to determine the physiochemical and diffusion dialysis properties of the prepared membranes. The prepared membrane shows high chemical stability. The acid dialysis co-efficient (U_H) values at room temperature (25^{o}C) were between 7.24 – 10.05 m/h, while the separation factor (S) ranged from 45.09 to 95.18. both the acid recovery (724 times) and separation factor (~4.5 times) are much higher than the commercial anion

exchange membrane DF-120 (U_H and S is 0.01 m/h and 18.8, respectively). Prepared anion exchange membrane is the potent candidate for the rapid acid recovery through a DD. The highlight of this work is the fabrication of novel poly (ionic liquid) based anion exchange membranes, which shows rapid acid dialysis performance and selectivity.

Keywords: Poly (ionic liquid), anion exchange membrane, diffusion dialysis, acid recovery.

MAGNETICALLY SEPARABLE CU-NANOPARTICLES CATALYZED BORYLATION OF PRIMARY AND SECONDARY ALKYL HALIDES WITH ALKOXY DIBORON REAGENTS AT ROOM TEMPERATURE

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ABSTRACT

Alkylboronic esters are very important reagents in synthetic organic/medicinal chemistry due to their unique reactivity, functional group tolerance, and accessibility, recent efforts have been committed to their efficient preparation. Although many excellent procedures have been reported, boryl substitution of alkyl halides is still challenging. Transition metal-catalyzed borylation of alkyl halides has emerged as a versatile and powerful approach for the synthesis of alkylboronate esters. However, most of the reported systems required multistep catalyst Synthesis, air-free conditions, rigorously dried substrates and solvents, non-recyclable expensive ligands and catalysts. Thus, there has been renewed interest in developing a convenient and recyclable catalytic system. Recently, the field of metal-nanoparticle-based catalytic systems has experienced rapid development, and various efficient synthetic methods for C–B bond formation have been developed under mild reaction conditions. Herein, we reported recyclable and non-precious Cu nanoparticles catalyzed boration of alkyl halides using B_2pin_2 (*bis*(pinacolato)diboron) as a boron source, under mild reaction conditions and in the absence of any ligand (Figure 1). The key results will be described.

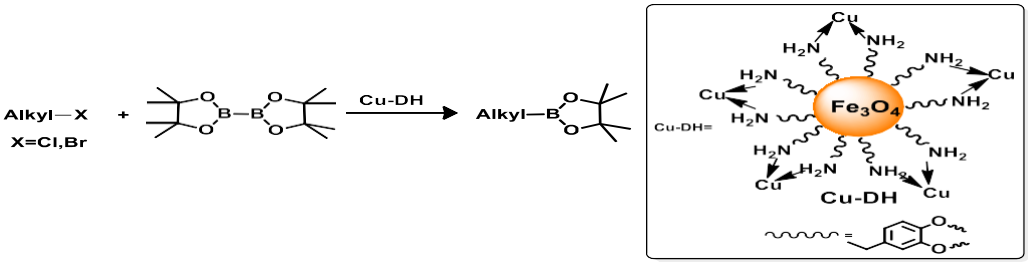

Figure 1

SYNTHESIS OF HIGHLY FLUORESCENT TETRA SUBSTITUTED IMIDAZOLE AND ITS ZINC, INDIUM COMPLEXES FOR OLED AND SOLAR CELL APPLICATION

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ABSTRACT

In the present work, we have synthesised2-(1,4,5-triphenyl-1*H*-imidazol-2-yl)phenol (TPI) and its Zn, In complexes has been characterized by spectroscopic methods such as ^{1}H-NMR, IR, SEM and EDX. The photophysical properties like, solvatochromic shift and quantum yield were estimated. Energy band gap of compounds were calculated in various solvents using theoretical and experimental methods. Further, photosensitization of TiO_2 nanoparticles has been investigated using absorption, steady state and time resolved fluorescence methods. The increase in absorbance and decrease in fluorescence spectra with different concentrations of TiO_2 nanoparticles confirmed the possibility of interactions between dye and TiO_2 nanoparticles. Rehm-Weller relation suggests that, decrease in fluorescence of zinc and indium was due to photo-induced electron transfer process and the Stern-Volmer studies suggest that, the fluorescence quenching mechanism was due to combined dynamic and static quenching process. The photo-induced electron transfer process has been used in solar energy harvesting applications by fabricating zinc sensitized solar cell. Photovoltaic energy conversion efficiency and fill factor of the zinc and indium complex were found to be 2.5, 2.1% and 0.8, 0.7 respectively.

Keywords: Imidazole; TiO_2 nanoparticles; Photo induced Electron transfer.

ANTIFOULING STUDY FOR ZINC DOPED ALUMINUM OXIDE BASED MIXED MATRIX MEMBRANES

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ABSTRACT

In this study, Zinc doped aluminum oxide ($Zn:Al_2O_4$) nanoparticle have been prepared by solution combustion method. Further mixed matrix membrane was prepared with polysulfone (PSf) by phase inversion method. The $Zn:Al_2O_4$ NPs and mixed matrix membranes were characterised by Powder X-Ray diffraction, scanning electron microscopy, Energy- dispersive X-ray spectroscopy, Attenuated Total Reflection- Infrared Spectroscopy, and Atomic force microscopy. Surface area of the nanoparticles were characterised by Brunner- Emmett-Teller (BET) technique. The membrane characteristic properties, such as hydrophilicity, water uptake capacity and porosity have been performed. The antifouling property of the membranes were studied and compared with plain PSf membrane. However the better results revealed by addition of NPs in PSf membranes.

Key Words: Zinc doped aluminium oxide ($Zn:Al_2O_4$) nanoparticles, Mixed matrix membranes, Hydrophilicity, Anti-fouling study.

A SURVEY ON MANET LAYER ATTACKS, COUNTERMEASURES AND ITS SECURITY CHALLENGES

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ABSTRACT

In recent years the MANET Mobile Adhoc Networks has been the challenging network over other networks. MANET has become one of the core networks since it has self-arrangement and upkeep capability. MANET experiences several security challenges here security is the

actual obstruction one in MANET. The challenges faces in MANET are self-organizing and infrastructure less networks. The features here includes does not have static infrastructure, there is no consolidated power to manage the network, and every node must rely on other nodes to have the network active. As the Mobile ad – hoc network is inconsistent and all the transmission and communication in these networks turns to vulnerable to several numbers of attacks and protection turns in to a major problem. Due to constrain of a defined centralized dominance, preserving the routing process turns into a demanding task therefore leaving MANETs are susceptible to attacks, which outcomes in degradation in the performance characteristics also poses a acute query about the dependability of various networks. In this survey paper we examine the disparate security attacks to Mobile ad-hoc networks and also explored available results. We attempt to offer a brief commencement to the types of various attacks and feasible counter measures to preserve the attacks.

Keywords—MANET, Security, Attacks, IDS.

BIO BATTERY USING CHROME SHAVINGS AND PLANT NANOPARTICLES

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ABSTRACT

Every day tons of waste chrome shavings are generated in India from 750 tanneries. These chrome shaving can be used to prepare many value added products. An attempt is made to use these chrome shaving wastes as an alternate energy source to produce DC Voltage in bio battery. Chrome shavings are hydrolyzed to make collagen paste. Separately, collagen fiber is thermally degraded to gelatin paste which is mixed with collagen paste; *moringo-oliferalam* leaves nanoparticles, onion nanoparticles, aluminum paste and conducting gel to form electrolyte paste. The electrolyte paste in association with copper and zinc electrodes, or, carbon and zinc electrodes work as bio battery which has been characterized using cyclic voltmeter (CV), Transmission electron microscopy (TEM), *scanning electron microscopy* (SEM), *Differential* Scanning Calorimetry (DSC) and *Thermogravimetric analysis* (TGA). The power generated using a single bio-battery is in the level of DC voltage of 1.5 V, 900 mA current for an AA size battery. An output of 18 V DC, 1200 mA is obtained from 80 well-

plates connected in series whereas 48 volt DC, 1900 mA has been obtained from a series parallel connection of 80 well-plates. Results show encouraging trends for commercial exploitation of the facility.

Key Words: Bio energy, Chrome shavings, collagen paste, Plant nanoparticles.

STRESS CORROSION STUDIES OF SILICON CARBIDE PARTICULATE REINFORCED ALUMINIUM 7075 METAL MATRIX COMPOSITES

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ABSTRACT

The stress corrosion resistance of aluminum 7075/Silicon carbide metal matrix composites (MMC's) in high temperature acidic media has been evaluated using an autoclave. The liquid melt metallurgy technique using vortex method was used to fabricate MMC's. Silicon carbide particulates of 50-80 μm in size are added to the matrix. Aluminum 7075 containing 2, 4, 6 weight percentage of Silicon carbide is prepared. Stress corrosion tests were conducted by weight loss method for different exposure time, normality and temperature of the acidic medium. The corrosion rates of composites were lower to that of matrix aluminum 7075 alloy under all conditions.

Key words: MMC's, Vortex method, Stress corrosion, Autoclave

A STUDY ON SYNERGISTIC INFLUENCE OF ADDITIVES ON NANOCRYSTALLINE ZINC ELECTRODEPOSITION AND ITS PROPERTIES

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ABSTRACT

The presence of new combination of additives cetyltrimethylammonium bromide (CTAB) Benzoic acid (BA) and 2-bromo-3-chloro-5,5-dimethylcyclohex-2-enone (BCD) on generates nanocrystalline, bright zinc coating on mild steel surface. The synergistic effect of additives on improving electroplating efficiency and throwing power of bath was analyzed. The study of morphology and microstructure of coating confirms the formation of nanocrytalline zinc coating with (110) preferred orientation and 83% reflectance. The corrosion resistance property and hydrophobic nature of zinc electrodespites have been systematically studied in presence of individual and mixture of additives. When mixture of all three additives (CTAB+BA+BCD) are added to plating bath bright, nanocrystalline, zinc coating with good corrosion resistance property was developed. The presence of any two additive mixtures out of three as well as single additive gave unsatisfactory deposit. Simultaneously, in optimum bath influence of brightener BCD concentration on morphology, preferred orientation and corrosion resistance property of bright zinc coating have been examined.

ELECTRODEPOSITION OF NI-HNT COMPOSITE COATING: INFLUENCE OF DEPOSITION CURRENT DENSITY ON MORPHOLOGY, TEXTURE AND ANTICORROSION BEHAVIOR

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ABSTRACT

Ni-halloysite nanotube (HNT) composite coatings on mild steel surface have been electrodeposited using Watts bath. The deposition of composite coating was carried out in presence of surfactant cetyltrimethylammonium bromide (CTAB) and HNTs at different current densities. The Zeta potential of HNT was analyzed using dynamic light scattering technique (DLS) confirms that HNTs (positive surface charge) have a greater tendency to move towards mild steel cathode and get incorporated in the coating. HNT particles alter the

composition, morphology, orientation and texture of the Ni-HNT composite coating at different deposition current density. The composition and microstructure changes influence on anticorrosion behavior of Ni-HNT coatings was analyzed by Tafel and impedance studies. The Ni-HNT composite coating derived at 6 Adm^{-2} showed higher corrosion resistance.

Keywords: Halloysite nanotubes · Composite coating · Morphology · Corrosion · Impedance

NEWS ARTICLE CATEGORY PREDICTOR

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ABSTRACT

Every newspaper or the digital news applications we use sort news according to its genre. Categories are high level groupings that allow easier navigation of the articles. The prediction makes easier the work of categorization of news articles. If a specific topic is related to more than one category then the algorithm must predict the relative percentage match to each category.News article category predictor focuses on designing and developing an application to predict the category of news article intended to upload in the newspaper. This paper presents the algorithm for classification of articles into different genres based on the information retrieval from the article. The algorithm proposed here helps to classify the topic and discover the new topic as they appear in the content or the report provided. The algorithm explained here basically uses keyword extraction algorithm that is applicable to any of the languages

ELECTRODEPOSITION AND CHARACTERIZATION OF Zn-Fe ALLOY COATINGS

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ABSTRACT

New electrolytic bath solution was optimized for the electrodeposition of nanostructured Zn-Fe alloy coatings on a mild steel. The influence of the bath composition and the current density on coatings were investigated. The corrosion behavior of the developed coatings was evaluated by the Potentiodynamic Polarization and Electrochemical Impedance Spectroscopy methods in 3.5% NaCl solution. The work reveals the excellent corrosion resistance ability of the coatings at 3 A dm^{-2}. Hardness of the coatings evaluated using Vickers hardness test was increasing with the c.d. and was maximum at 3 A dm^{-2}. Roughness of the Zn-Fe alloy coatings was obtained using Atomic Force Microscope (AFM). These coatings were characterized by XRD and SEM-EDX. Phase structure and Texture coefficient and the crystallite grain size of the coatings were calculated and discussed using XRD

DEVELOPMENT OF PLATINUM COATING BY ELECTRODEPOSITION TECHNIQUE.

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ABSTRACT

For the preparation of coatings consisting of either a single metal or a combination of two or more metals in the form of an alloy, the electrodeposition has long been used. The electrochemical deposition of Platinum on stainless steel from Pt 5Q bath (Pt $(NH_3)_4HPO_4$ solution adjusted to pH 10.5 and temperature 550C) was studied by cyclic voltammetry and chronoamperometry. The platinum-coated SS304 which act as substrate, in which the structure and surface morphology of the coatings were characterized by scanning electron microscopy (SEM) and X-ray diffraction (XRD). Pulse electrodeposition of platinum was designed at the development of some properties like finer grain size, anti-tarnishing, lower porosity and

improvement in the surface property. The finest quality was obtained from the pulse plating condition of 0.2 A/dm2 current density and 25% duty cycle. In this work relative contrasts and performance of these coatings obtained by DC (Direct current) electrodeposition and PC (Pulse coating) electrodeposition were investigated.

Keywords: SEM,Cyclic voltammetry, Chronoamperometry, Pulse coating, stainless steel.

DYE-SENSITIZED NANO-COMPOSITE DOPED POLYMER FILMS FOR OPTICAL LIMITING – A RESEARCH PROPOSAL BASED ON THEORETICAL ANALYSIS

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ABSTRACT

Nanophotonics is an emerging area where nanotechnology is used to change the physical and chemical properties of photonic materials or the effectiveness of photonic processes that have major applications in optical communication and optical computation. Though many photonic devices are developed using the nonlinear optical materials, the efforts are still going on to increase their efficiency towards 100 % and other device characteristics towards their optimum level. In order to improve the efficiency of the third harmonic process further, we have a plan to use dye-sensitized metal nanoparticles doped in PMMA films. It is expected that the ability of nanotechnology in tailoring the physio-chemical properties of the materials will give rise to the optimum nonlinear devices to be used in nanophotonics. A considerable improvement in both nonlinear optical susceptibility and laser damage threshold is expected based on the results published in the case of dye-sensitized metal nanoparticle doped solar cells. Such a research may contribute the efficient nanophotonic devices such as all optical switches which are the basic building blocks of the final dream of realizing all optical computers. In this paper, a theoretical study is carried out on the effect of sensitization of some well-known nanocomposites by nonlinear dye-doped polymer matrix in order to change the dielectric and nonlinear susceptibility. This is achieved by the systematic study of the size of nanoparticles used for sensitization study, various donor-acceptor combinations, and concentration of dyes & nanoparticles in the sample films. The nonlinear absorption coefficient for each case and the theoretical optical limiting curve is drawn based on the estimation of nonlinear susceptibility.

Keywords : Dye-sensitization, Nano-composites, Polymer films, Nonlinear absorption, Optical limiting.

CLEANING THE ENVIRONMENT USING NANOTECHNOLOGY – A REVIEW BASED MACHINE DESIGN

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ABSTRACT

Nanotechnology being a universal technology has potential abilities to provide solutions to the environmental degradation problems through its precision pollution monitoring abilities using nanosensors, lower energy needs due to lightweight strong materials, and reducing the use of harsh cleansers through the applications of nanocoatings to the surfaces. A more advanced nanotechnology solution will lead to building a product with molecular-level precision through the use of productive nanosystems. In this paper, we analysed the use of nanotechnology and techniques in controlling environmental pollution and developed a concept of using nanotechnology-based techniques in optimizing large scale environmental cleaner using bottom-up and top-down methods based on a systematic review. Finally, a segregated large-scale environmental cleaning machine is proposed which works on renewable solar / wind energy. The proposed concept of the machine is analysed using ABCD framework.

Keywords: Nanotechnology, Nanosensors, Nanotechnology based environmental cleaner, ABCD analysis.

GRAPHITIC CARBON NITRIDE (G-C_3N_4) NANOSHEETSTEMPTEDMIXED MATRIX MEMBRANE FOR REMOVAL OF TOXIC METAL IONS FROM WATER

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ABSTRACT

Removal of heavy metal ions from water is being a challenge and polysulfone membranes have shown great potential for water purification, but their permeability and separation capacity are poor, which limits their practical applications. In this work, g-C_3N_4nanosheets tempted membranes were developed to improve the permeability and separation performance of polysulfone (PSf) membranes. Graphitic carbon nitride nanosheets was prepared by calcination of urea and melamine. The mixed matrix membranes were prepared by varying the stoichiometric amounts of g-C_3N_4nanosheets and polysulfone via phase-inversion method. The prepared g-C_3N_4 nanosheets and membranes was verified by Atomic Force Microscopy (AFM), Field Emission Scanning Electron Microscopy (FESEM), X-Ray diffraction technique (XRD), Brunauer-Emmett-Teller (BET), and Fourier-Transform Infrared Spectroscopy (FT-IR). After incorporation of the g-C_3N_4nanosheets in to the membrane, the water permeance was effectively improved than the plain PSfmembrane.In addition, the good separation performance demonstrates that the incorporation of g-C_3N_4 nanosheets is an effective strategy to improve the PSf membrane properties, which can promote their application in water purification.

Keywords:g-C_3N_4nanosheets, composite membrane, flux enrichment, toxic metal ion.

ADSORPTION PROPERTIES OF BIO-ADSORBENT ON VARIOUS DYES AND HEAVY METAL IONS IN WASTEWATER

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ABSTRACT

Several methods have been investigated for the removal of dyes and heavy metal ions from the waste water in that carbon adsorption plays good role. In this study, adsorbent was prepared using biological source by calcination and easy chemical treatment. The calcined bio-adsorbent

were characterised by Powder X-Ray diffraction, scanning electron microscopy. Surface area of the bioadsorbant were characterised by Brunner- Emmett-Teller (BET) technique. The surface area and the pore volume of the bio-adsorbent were 1061 m^2g^{-1} and 0.5325 cm^3g^{-1} respectively. Finally, the adsorption properties of bio-adsorbent were studied by using various dyes such as Methylene Blue, Methyl Orange, Rhodamine-6G, Rhodamine-B and heavy metals such as Lead, Cadmium. The complete adsorption was occurred within the 10 min of contact time, bio-adsorbent dosage of 25mg for 100 ppm in concentration. This study displayed that the possibilities of using this bio-adsorbent to remove dyes and heavy metal ions.
Key Words: Adsorption, Bio-adsorbent, Wastewater, Dyes, Heavy Metal Ions.

AN EXPLORATIVE RESEARCH ON PRODUCTION AND USE OF NANOBOTS IN HEALTHCARE INDUSTRY SECTORS

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ABSTRACT

Healthcare is considered as one of the potential industries where nanotechnology is expected to play a vital role. Nanobot is an emerging field of nanotechnology creating machines or robots whose parts are in nanometre scale. Nanobots are microscopic robots measured nanometers scale. They are still in the research and development phase, but on realization, are expected to do specific tasks at the atomic, molecular and cellular levels and help in bringing about many breakthroughs, especially in medical science. The circulatory system of living beings is a natural highway for nanobots which will cruise through the bloodstream to the area of distress. They may be used to attach themselves to specific cells, such as cancer cells, and report the position and structure of these tissues. Nanobots can be biological or synthetic but are adapted to perform preprogrammed tasks at the molecular and atomic level. Nanobots are expected to be autonomous in nature and powered by a small cell or battery, or even solar cells. The whole idea behind nanobots is in having a device which can interact at the nanoscale and help in understanding or manipulating structures at the nanoscale level. In the development of nanobots, nanoassembly and nanomanipulation have important roles. In this paper, we have explored the possibility of production and control of nanobots for managing various diseases
Keywords : Nanotechnology, Nanobots, Nanomedicine, Healthcare industry.

COMMERCIALIZATION OF NANOTECHNOLOGY PRODUCTS AND SERVICES – TOP DOWN AND BOTTOM UP MODEL

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ABSTRACT

Technology commercialization is the process of converting ideas into products for businesses and consequentially, creating demands for the products and jobs for the people. Commercialization of nanotechnology from research to economically viable products is particularly vulnerable to the "Valley of Death" point of commercialisation graph compared to any other technologies due to the reasons related to a product focus, market engagement, scale up and product development. From a business perspective, the essential elements for the successful commercialization of a specifically directed nanotechnology include innovative products, market size, market potential, and the current economic scenario and accordingly using qualitative data collection instrument namely focus group method, we have developed a model for successful nanotechnology commercialization process which includes ten steps to develop standard products/services. In this paper, we have further improved our model to take care of industry push through Top-down approach and market pull through Bottom-up approach so that disruptive technology commercialization will accelerate by our improved model which has a preliminary focus on educating the entrepreneurs and customers.

Keywords: Technology commercialization, Nanotechnology, Top-down approach of commercialization, Bottom-up approach of commercialization.

HOW TO ACHIEVE SINGULARITY USING NANOBIOTECHNOLOGY ? – A PREDICTIVE ANALYSIS

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ABSTRACT

The technological Singularity is a hypothetical concept to be created in the future due to the invention of super-intelligent machines which are network connected intelligent computers &

machines. Superintelligence is a cognitive capacity created technologically which is far above the general thinking capacity of humans. The technological singularity is predicted and the name is coined by Vernor Vinge, which is a hypothesis that the discovery of artificial super intelligent machine systems will abruptly trigger runaway technological growth to an infinite amount, resulting in unfathomable changes in the society and to human civilization. Artificial superintelligence is a term referring to the time when the capability of computers and artificial intelligence machines will surpass humans. At the time when the technical singularity is created, the artificially developed nonbiological intelligent machines are expected to be several billion times powerful compared to all human intelligence available today. In this paper, this hypothetical situation and the possible scenario of realizing them using ICCT and nanotechnology concepts are discussed and possible time frames of such discoveries are predicted and analysed.

Keywords: ICCT underlying technologies, Artificial intelligence, Nanotechnology, Nanobiotechnology, Technological singularity, artificial superintelligence, Technology time-line.

OPTIMIZING ELECTRICAL CHARGE STORAGE IN NANOTECHNOLOGY BASED DEVICES FOR ELECTRIC VEHICLES

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ABSTRACT

Electrical engines for electric vehicles have reached a satisfactory level of development so that they became superior internal combustion engines in terms of their simplicity, efficiency, durability, accelerating ability, cost, and environmental friendliness. However, they need high density electric field for satisfactory performance from a suitable material to be used as dielectric/electrolytic media in the battery. Further, the storage of high-density electrical energy at high charge and discharge rate is an important technological requirement. The energy storage battery should capable to have high specific energy (Wh/kg) and high specific power (W/kg), which provides rapid charge to reduce the long charging time required and to hold huge charge density so that long distance per charge can be achieved. It is proved that nanomaterial-based alkali ions are potential and optimum candidates for high density electric charge storage and in this paper, we present a systematic review on recent alkali-ion based electric charge storage

systems by considering the best current battery systems and ideal battery systems and by finding the gap for research. Based on findings many research agendas are proposed to substantially improve the efficiency of nanomaterial-based battery systems for Electrical vehicles.

Keywords : Nanomaterial-based battery systems for Electrical vehicles, high-density electrical storage system, nanotechnology.

PATENT ANALYSIS ON LITHIUM ION BATTERY COMPRISING NANOMATERIALS

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ABSTRACT

Patent analysis is a newly developed systematic method by our team during 2018. This method focuses on analysis, description, and interpretation of a chosen patent in any area in a systematic way so that analyser and the reader learn the invention with the nature of novelty of the process or the device patented. Such an analysis process of the patent might lead to the development of new concepts or theory. The procedure of patent analysis contains an evaluation of the patent in terms of its advantages, benefits, constraints, disadvantages, effectiveness, and future value. Since the invention of an optimum electric charge storage device in the transportation industry sector is in high demand to solve the future renewable energy transportation systems in the society, the high-density durable energy storage systems are finding importance. In this paper, we have analysed and interpreted a US patent No. 7,060,390, on Lithium ion battery comprising nanomaterials invented by Chen, Ga-Lane, and Charles Leu during 2006, using our systematic study which include Description on Patent, Description /Comments on Drawings of a Patent, Detailed Description on the Invention, Claims of the Invention, Number of Citations in the Patent, Number of Citations for the Patent, List of Similar Inventions, and Legal Issues Related to Inventions.

Keywords : Patent analysis, Li-Ion Battery, Nanotechnology, Transportation sector.

NANOTECHNOLOGY IN PHARMACOLOGY & PHARMACEUTICAL RESEARCH – OPPORTUNITIES, CHALLENGES, & RESEARCH AGENDAS

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ABSTRACT

Nanotechnology is considered as a general-purpose technology of 21st century, having spread its roots to all anticipated innovations in the society and predicted to solve all major problems and constraints for comfortable human life in society. The field of nanotechnology integrated with other basic areas like biotechnology, medicine, dentistry, pharmaceutical sciences, and photonics emerged as new subsections like Nano-bio-technology, Nano-medicine, Nano-dentistry, Nano-pharmaceutics, Nano-photonics etc. respectively. Nanomedicine is also an emerging and fast evolving field where the nanoparticles are used for diagnosis and therapy of many diseases, and in regenerative medicine. All these areas have many research opportunities due to advantages and benefits by means of special properties of nanomaterials used for fabrication of system components. In this paper, we have discussed, and analysed various Opportunities and Challenges of Nanotechnology based Research in Pharmacology & Pharmaceutics including drug discovery & delivery, cosmetics, and Pharmaceutical equipment with varied and smart properties. The paper also made a study on advantages, benefits, constraints, and disadvantages of such products, systems, and services for various stakeholders of pharmaceutical industry and in health service sector.

New Knowledge Created/New Analysis & Interpretation: The paper analysed and interpreted the new research opportunities and challenges of nanotechnology applications in Pharmacology & Pharmaceutics field by identifying and discussing new research agendas to improve the health quality of human beings.

Keywords: Nanotechnology for Pharmacology & Pharmaceutics, new research opportunities and challenges, Research agenda.

DEVELOPMENT OF Ni-V_2O_5 NANOCOMPOSITES

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ABSTRACT

Ni-V_2O_5 composites were developed by DC and PC electrodeposition methods using sulfamate bath. The obtained composites were good with appreciable corrosion resistance properties. The DC and PC of Ni-V2O5 composites were obtained for 0.125g/L, 0.25g/L, 0.375g/L and 0.50g/L. 0.125g/L of V_2O_5 in the solution gives maximum inclusion of nanoparticles with fine coating and good corrosion resistance in the coating. The density of V_2O_5 nanoparticles is 4.339 g/cm3, the frequent agglomeration and settling down of the nanoparticles was highly minimized by repeated sonication using probe sonicator by stirring at 1300rpm prior to electrodeposition and during electrodeposition the sulfamate bath containing nanoparticles is continuously stirred at 400 rpm

DEVELOPMENT OF Ni–TiO_2-CNT NANOCOMPOSITES

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ABSTRACT

In this investigation, Ni–TiO_2-CNT nanocomposites were generated by DC and PC electrodeposition methods from sulfamate bath. The commercially available TiO2 nanoparticles and single walled carbontubes (SWCNTs) were taken and mixed in the ratio 75:25 to get TiO_2 :CNT nanoparticles. The mixing was done by simple hydration and dehydration method. The superior and high corrosion resistant DC and PC composites were obtained by optimizing all the variables like current density, pH, rotating speed, coating time and bath constituents. The concentration of the TiO2-CNT composition in the bath was varied from 0.25 g/L to 1.25g/L to get a good coating with highest corrosion resistance. The 0.75 g/L TiO_2CNT concentration in the bath shows excellent corrosion resistance with highest amount of particle inclusion in the coating. During the nanocomposite electrodeposition experiments, the bath solution was sonicated from a probe sonicator and stirred using a magnetic stirrer at

1000 rpm prior to electrodeposition. Bath solution was continuously stirred at 300 RPM during the deposition

GENERATION OF Ni–NB_2O_5 NANOCOMPOSITES

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ABSTRACT

In this investigation, Ni–Nb_2O_5 composite thin films were generated by DC and PC electrodeposition methods from sulphate baths. All the bath variables like current density, pH, rotating speed, coating time and bath constituents were optimized to get the desired coating. Nb2O5 concentration in the bath was optimized, and 1g/L of Nb_2O_5 in the solution gives maximum inclusion in the coating. During the nanocomposite electrodeposition experiments, the bath solution was repeatedly sonicated from a probe sonicator due to the high density Nb_2O_5 particles (4.60g/cm3) and stirred using a magnetic stirrer at 1000 rpm prior to electrodeposition. Also, Nb2O5 nanoparticles in the solution are continuously stirred at 150 RPM during the deposition.

ELECTROCHEMICAL AND ADSORPTION STUDIES OF RITONOVIR FOR MILD STEEL IN ACIDIC MEDIUM.

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ABSTRACT

Corrosion inhibition of mild steel by a Ritonovir has been investigated by using electrochemical methods such as polarization and electrochemical impedance techniques. The experimental results suggested that Ritonovir is a good corrosion inhibitor for mild steel in 1M Hydrochloric acid medium. The inhibition efficiency increased with the inhibitor concentration. The adsorption of Ritonovir obeys Langmuir adsorption isotherm. The thermodynamic parameters such as $-\Delta G^0_{ads,}$ $-\Delta H^0_{ads,}$ $-\Delta S^0_{ads}$ are evaluated. The effect of temperature were discussed by activation parameters.

ZN-Fe ALLOY NANO STRUCTURE COATINGS

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ABSTRACT

Zn-Fe alloy electrodeposition was carried out in the presence of new condensation product. Hull cell was used for optimizing the operating parameters and bath constituents to get nano sized grain size coating. SEM and TEM were used to study the grain size of the coating. XRD was used to calculate the average grain size of the coating. AFM study witness the TEM studies. Corrosion behavior of these coatings were studied by chemical and electrochemical methods.

SYNTHESIS OF COBALT FERRITE NANOPARTICLES

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ABSTRACT

Nanotechnology is an emerging area with a broad area of applications in the field of Nanoelectronics, Supercapacitors, Drug-delivery system and Biosensors. Due to their high surface area, ability to tune the physicochemical properties such as high melting point, thermal and electrical conductivity, catalytic activity, absorptive phenomena as well as scattering with enhanced performance with enhanced phenomena which makes these **nanoparticles** an outstanding material. Here, we synthesized the Cobalt ferrite ($CoFe_2O_4$) nanoparticles due to their low cost, small particle size, high magnetic property which makes us an interesting feature over other due to many applications. This nanomaterial has been connected magneto-optical devices, contrast agent for MRI[2], drug delivery systems[3], spintronics, magnetohyperthermia[4] and many more. The present work summarizes the synthesis and characterization of cobalt ferrite nanoparticles. They were synthesized by hydrothermal method by the reaction of surfactants such as PVP and CTAB with cobalt nitrate & iron nitrate solutions at pH 9. The solid product formed was calcined at 600˚C in a muffle furnace and characterized using Scanning electron microscopy and powder XRD.

Key words: Nanoparticles, Electron microscopy, XRD

SYNTHESIS, ANTI-INFLAMMATORY ACTIVITY AND *IN-SILICO* STUDY OF SOME NOVEL MORPHOLINE BASED CARBOXAMIDES

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ABSTRACT

Inflammation is referred as a complex biological process that happens when body tissues are exposed to hazardous stimuli, such as irritants and pathogens [1]. The process of Inflammation is threatens human health, and exaggerated and prolonged inflammation may cause various diseases, including arthritis, sepsis, and even cancer [2]. Two series of carboxamides were synthesized from 3-fluoro-4-morpholinoaniline and different substituted aromatic/heterocyclic carboxylic acids. The newly synthesized compounds were characterized by IR, ^{1}H NMR, ^{13}C NMR and Mass spectral data. All the newly synthesized amide derivatives were screened for anti-inflammatory activity by following carrageenan induced rat paw edema method. Some of the compounds were found to be more potent. Molecular docking interaction of active compounds revealed that effective binding was observed in the pocket of COX-I and COX-II proteins.

A STUDY ON CYBER STALKING

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ABSTRACT

This paper reviews the cyber stalking issues in technological perspective. It is a type of cyber crime in which the internet or other electronic means are used to stalk on an individual, a group or an organization. False accusation, defamation, libel, monitoring, identity theft, threats, vandalism solicitation for sex are used to threaten. Stalking is continuous process. It consisting of a series of action and each of which may be entirely legal in itself. Some of the prevention and avoidance mechanisms are suggested in this paper as a result of detailed survey.

Keywords: Cyber Crime, Internet, Cyber Stalking, Cyber Security

A STUDY ON RECOMMENDER SYSTEMS

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ABSTRACT

This paper is an outcome of a review done on recommender systems. Recommender systems filter the information and do predictions based on ranking approach. They make suggestion based on users' behaviour. They are inevitable in the current trend irrespective of fields. Particularly in the business field, its usage is enormous. In this paper various applications of recommender system is analyzed. Frequently applied algorithms, techniques and approaches to implement such systems are discussed in detail.

Keywords: Recommender System, Business, Education, Commerce, Healthcare

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RECOMMENDER SYSTEMS IN BIG DATA ENVIRONMENT

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ABSTRACT

In the current decade, recommendation systems have changed the way of communication between both websites and users. Recommendation system sorts through big data to identify interest of users. It makes the information search easier through suggestions. For that purpose many methods, techniques and tools are used. Collaborative filtering is a frequently applied method for making predictions about the interest of customers. CHARM algorithm is one of frequent patterns finding algorithms and it is capable to handle huge datasets. This paper discusses some issues of applications of recommender systems in big data environment.

Keyword: Big Data, Recommender System, Collaborative Filtering, CHARM Algorithm

A REVIEW ON EDGE COMPUTING

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ABSTRACT

Edge computing is an advanced computing architecture in the field of information technology. Raw data is processed as near to the data source as possible. It avoids sending the data over the internet to a remote data center for processing. This paper presents a review of literature on edge computing. It optimizes internet devices and web application by bringing computing closer to the source of the data. The significant advantage is that, the edge of the network is geographically close to the device. Edge computing minimizes bandwidth use and server resources. It reduces latency by moving processes to the edge. Edge computing provides much new functionalities. This paper helps the researchers to understand the applications and benefits of edge computing.

Keyword: Edge Computing, Cloud Computing, Information Processing, Network Optimization.

FACE RECOGNITION USING DEEP LEARNING

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ABSTRACT

Face recognition is one of the highly used modern technologies and has multiple real life applications. It is a collection of processes such as detection of object, alignment, feature extraction and a recognition task. Face recognition is making a positive identification of face in photo or video against pre-existing database of faces. Deep learning methods are found better to carry out this task. Deep learning models first approached then exceeded human performance for face read to cognition task. Systems can be trained to recognize a set of people and to learn in on line way. This paper is provided with a comprehensive study on literature.

Keywords: Face Recognition, Machine Learning, Deep Learning, Images Processing.

FOG COMPUTING – A REVIEW

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ABSTRACT

Fog computing is an advanced and extended version of cloud computing. The computing takes place at the edge of the network. There are many companies currently working on many research issues. Fog computing is similar to cloud computing, but far better than cloud computing. They provide faster end-user experience and have better performance than cloud computing. Centralized cloud computing is still more convenient, feasible platform for most of real-time applications and services but not superior to fog computing. It is the platform where it provides data, computation, storage and application services to end-users. The motivation of fog computing lies real time scenarios such as smart grid, smart traffic lights in vehicular networks and software defined networks. The main aim of the fog computing is to place the data close to the end user. This paper presents a review of literature on fog computing.

Keywords: Fog Computing, Cisco, Cloud Computing, Real Time Applications.

OBJECT DETECTION USING DEEP LEARNING

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ABSTRACT

The identification of object in the image along with its localization and classification is referred to object detection. It has widespread applications and it is a critical component for vision based software systems. The handcrafted features are used in most of the cases. Shallow trainable architectures are frequently applied for object detection. This paper provides the review about modern object detection algorithms that use deep learning methods.

Keywords: Object Detection, Deep Learning, Feature Selection, Image Processing.

ONION ROUTERS

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ABSTRACT

This paper presents a review of literature on onion routing method. Onion routing is a anonymous communication technique in computer networks. In onion networks, messages are encapsulated and encrypted in layers. In onion routing, the connection is maintained between dissimilar nodes. The connection hops from one server to another and when it reaches the last server on this circuit it is the server that we wanted to contact and it will process our request and serves us the desired web page which is sent back to us using the same network. It is because the message we send and the responses we receive are encrypted with different keys, with a unique key for encryption for every different server visit. The client has access to all the keys but the servers only have access to the keys specific for encryption/decryption to that server. Since this process wraps your message under layers of encryption which have to be peeled off at each different router or node just like an onion that's why it's called an onion router. Now this process of routing your requests is not bulletproof and can be cracked, but the effort required to do so outweigh the reward for a normal use case scenario.

Keywords: Routing Algorithms, Onion Routing, Communication Networks

A STUDY ON FINGERPRINT RECOGNITION SYSTEMS

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ABSTRACT

This paper is an overview of contemporary researches in fingerprint recognition system. In this paper, algorithms which are applied in the past researches are highlighted and other issues in fingerprint recognition systems are discussed. This paper provides a brief review and the conceptual structure of fingerprint recognition methods. The basic fingerprint recognition system consists of four stages. The sensors are used for enrolment and recognition to capture the biometric data. The pre-processing stage removes the unwanted data and increase the clarity of ridge structure by using enhancement techniques. Feature extraction stage gets the input

from the output of the pre-processing stage to extract the fingerprint features. The matching stage is to compare the acquired features with the predefined template in the database. The database stores the features for the matching stage. The aim of this paper is to review various recent works on fingerprint recognition system and explain fingerprint recognition stages step by step. This paper summarizes the concepts, challenges and applications of fingerprint recognition systems.

Keywords: Finger Print Recognition, Pattern Recognition, Biometrics Validation.

APPLICATIONS OF SUPPORT VECTOR MACHINES

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ABSTRACT

Classification is one of the most significant tasks in the field of data science. It is found in different applications such as text categorization, tone recognition, image classification, micro-array gene expression, and proteins structure predictions. This paper presents a survey on support vector machines' applications in various fields. Support vector machine is a powerful machine learning method developed to make significant achievements in the field of data mining. They are very crucial for classification problems and the performance is improved by learning from the training samples. In this paper various type of support vector machined are analyzed and compared.

Keywords: Data Classification, Machine Learning, Support Vector Machine, Pattern Recognition

APPLICATIONS OF CLOUD COMPUTING IN HEALTHCARE SECTOR

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ABSTARCT

Cloud computing is internet based computing where services are provided to the end users. As the various technologies have started to grow, the data is transmitted from server to a local system, and finally the data ended up locally. The companies started to enhance the

technologies and started to provide the service through the internet and hence here evolved Cloud computing. This paper presents a survey of various applications cloud computing technologies in healthcare field. Security is only the major factor which, lot of them argues against cloud computing in Healthcare. A patient record is too personal and is to be maintained with high security. In cloud based applications, the data will be maintained globally with the provider. The Healthcare service providers can create integrated online environments where a user can create and store personal records, get information, find doctors, make medical appointments, communicate online, manage medications, share information with providers and more. Both the cloud platform and the cloud provider must ensure all of the medical data remains secure and private. So long as these conditions are met, there will be less and less resistance to cloud computing adoption in the healthcare industry.

Keywords: Cloud Computing, Healthcare Industry, Information Security, Data Privacy.

SECURING MOBILE COMMUNICATIONS USING PUBLIC KEY CRYPTOGRAPHY

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ABSTRACT

In the present scenario, mobile phones are considered to be the most common communication devices in the history of tele communications. Mobile phones are not only used for casual sending and receiving of data, but also for, social security numbers, bank account details and passwords. Public key cryptography is a proven security solution, which can be used to secure the mobile communications. Several researchers have proposed server-based architectures and public key cryptography solution to secure the mobile communications. This paper discusses various methods of public key cryptography to secure the mobile communications. The implementation of public key cryptography provides confidentiality, authentication, integrity and non-repudiation security services needed for mobile communication. Compared with server based architecture, non-server based architecture has lower risk and the security has been improved. Challenges and most frequently applied methods are compared in this paper.

Keywords: Mobile Communication, Information Security, Wireless Networks, Cryptography.

BLOCKCHAIN TECHNOLOGY – A REVIEW

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ABSTARCT

Blockchain is a growing list of records, called blocks that are linked using cryptography. Blockchain is the technology that underpins digital currency such as Bitcoin, Litecoin, and Ethereum. This technology allows digital information to be distributed, but not copied. This paper reviews various issues, challenges and techniques of Blockchain. Digital ledger is method to store data in a distributed network. The technology behind this is called Blockchain technology. The potential for Blockchain technology is not limited to bitcoin. Blockchain can also be applied for other currencies rather than crypto-currency. Blockchain method is considered to be the safest transaction method, because the transactions cannot be traced and there is no third party involved.

Keywords: Information Security, Blockchain, Cryptography, Digital Currency, Cryptocurrency.

MONITORING THE CLOUD APPLICATIONS

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ABSTRACT

This paper is an outcome of review of techniques for monitoring cloud based applications. Cloud monitoring is the reviewing and managing processes of operational workflow of process within a cloud infrastructure. It uses manual or automated methods. Monitoring and management techniques ensure a cloud infrastructure or platform performs optimally. Cloud monitoring is mainly a part of cloud security and management. It is implemented through automated monitoring software that provides central access and control over cloud infrastructure. Administrator of cloud system can review the operational states and health of any cloud based device or component. It is ensuring cloud infrastructure and service availability. Cloud monitoring data is used to measure the performance of the entire

infrastructure. Some issues and techniques of cloud monitoring system are discussed elaborately in this paper.

Keywords: Cloud Monitoring, Cloud Architecture, Cloud security, System Control.

A STUDY ON DATA WAREHOUSES

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ABSTRACT

Data warehouse is large store of data accumulated from a wide range of sources. They are used for business reporting, guide management decision and data analysis. It is considered a core component of business intelligence. It is an advanced technology often associated with enterprise computing in a business environment. There are three types of data warehouse: Enterprise data warehouse, Operational data store and Data mart. It has a great value in analyzing sales information. The significant benefits are potential return of investment, cost-effective decision making, better enterprise Intelligence. In this paper, technologies related to data warehouses are discussed in detail.

Keywords: Data Warehouse, Data Security, Business Intelligence, Data Mart, Data Center

EYE TRACKING SYSTEM IN THE HEAD MOUNTED DISPLAY IN FIGHTER HELMET

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ABSTRACT

The present work is disclosing the new evolution of the new generation fighter helmet. The costliest,strongest and smart weapon in the history of the avionics. Every pilot ability will be shown greater with this instrument. Aircraft performance is too better from the history to now because of the new evolutionary helmets. Eye trackers are the main device which is going to be used in the present work. Still now there are night vision display and high definition picture quality display. Sensors are the great workers in the HOD. Eye trackers measures the rotation

of the eye and eye motion is sensed. The object which is to be target is take in to the action. So the working is furthermost developed due to eye tracking systems

PREPARATION AND EVALUATION OF ABRASION RESISTANCE AND COMPRESSIVE STRENGTH OF Al/SiC/GRAPHITE BASED METAL MATRIX COMPOSITES

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ABSTRACT

In the past few years the global need for low cost, high performance and good quality materials has caused a shift in research from evaluation of purely metallic constituents into light weight composite structures. Considered with the matrix phase of pure aluminium or alloy of the same metal and the reinforcement materialused is a non-metallic ceramic such as SiC, Al2O3, SiO2 contribute greatly to the structural behaviour once it is processed and tested in the standard conditions. Present work highlights the crucial effect of silicon carbide particulates and specified amount of graphite on aluminium 6061 matrix material. The fabrication of samples were done by most convenient technique called stir casting by adding reinforcing materials in the range of 3%,6%,9% by weight which is effectively mixed in to the matrix of aluminium 6061 alloys by maintaining the standard conditions. Hardness test, shear properties were evaluated experimentally to assess the influence of Silicon carbide with constant amount of graphite powder on the matrix material. It is observed from the results the addition of ceramic particles influence greatly on the hardness number which increases by increasing the silicon carbide content. Similar trend was observed while assessing the compressive strength of the composites along with considerable change incurred with shear deformation was properly recorded.

Keywords; Silicon Carbide, MMC's, Al-MMC's

ELECTRICAL ENERGY HARVESTING IN AIRCRAFT BY USING CARBON FIBER BATTERY

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ABSTRACT

The concept of harvesting electrical energy onboard has aroused a renewed interest in aircraft industries. In this context a piezoelectric material is proposed that harvests mechanical vibrational energy available in considerable amount from aircraft wing vibrations due to turbulence. Embarked piezoelectric material which is an electro mechanical converter when replaced in wing panels which undergoes mechanical vibrations and there by generating electricity. A static converter transforms the electrical energy into carbon fibre structural batteries placed in wing panels.Electrification of aircraft is not yet implemented because in order to fly the aircraft for a long distance, electricity has to be stored in bulk batteries which increases weight and also consumes large space of the aircraft which is the main problem in aviation industry, so we are developing a structural carbon fiber composites with battery functionality. These devices can withstand structural loads while simultaneously storing electrical energy. By designing with enough structural and energy efficiency, these materials enables significant system-level weight reductions by replacing metallic components while providing storage of electrical energy for uses in an aircraft. To enable this concept, we have designed mechanical load- bearing properties directly into the battery electrodes and electrolyte such that each component is itself multifunctional. Carbon fiber fabric as anode material, lithium ion phosphate coated on to aluminum fiber weave as cathode material, and gel polymer electrolytes are each being developed to exhibit a desirable combination of mechanical strength and electrochemical performance. These components are being integrated using moldable, scalable, cost-effective composite processing techniques. A prototype of a real system is reviewed to demonstrate the potential benefits.

DEVELOPMENT OF NANO ORGANIC LAYER ON ZINC SURFACE FOR CORROSION INHIBITION IN ACIDIC MEDIA

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ABSTRACT

The corrosion inhibition studies carried out on zinc surface using an organic compound in corrosive 0.1 M HCl medium is discussed in the present research work. Weight loss, Tafel polarization and impedance spectroscopic methods have shown good corrosion inhibition efficiency for zinc surface in presence of organic molecules. The results obtained from the different methods are in good agreement with each other. The results from different methods are in good agreement with each other. The corrosion rate decreases with increased concentration of organic inhibitor, which can be dedicated to the development of nano layer on the metallic surface. The nano layered surface adsorption of the organic molecules was found to be spontaneous and the surface study using scanning electron microscope (SEM) confirmed the adsorption on the zinc surface.

GROWTH, LINEAR AND NONLINEAR OPTICAL, ELECTRICAL, MECHANICAL AND DIELECTRIC PROPERTIES OF ZINC SULPHATE DOPED L-ALANINE NANO SINGLE CRYSTAL FOR OPTOELECTRONIC APPLICATIONS

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ABSTRACT

Research in semi organic materials is an intensifying area because of their fascinating nonlinear optical effects used in optical communication, optical computing, optical amplifiers, optical parametric oscillators, second harmonic devices and other electro optical applications. The conception and fabrication of crystals with nanometric to sub-micrometric size exhibiting strong nonlinear quadratic optical responses is a topic of growing interest. In particular, Second Harmonic Generation (SHG) active nano-crystals offer a broad range of potential applications from nanoprobes for bio-imaging to nano-scale photonics with original optical properties. In

this context, single crystals of zinc sulphate doped L-alanine (LAZS) were grown by slow evaporation method from aqueous solution under optimized conditions. These crystals were studied by various characterizations tools viz., structural, FTIR analysis, UV absorption, nonlinear optical (NLO), thermal, dielectric and micro hardness studies. Powder XRD study showed that the grown crystal has crystallite size of 55 nm with lattice strain being 0.0033. Single crystal x-ray diffraction analysis was carried out to confirm the unit cell parameters and cell volume. The vibrational assignments of various functional groups present in the sample were analyzed by FTIR study. The TGA-DTA study infers that the crystal is stable up to 288 ^{o}C. The recorded UV-VIS-NIR spectrum shows that, the crystal has wide window and high transmittance. The dielectric parameters as a function of frequency were measured. The SHG efficiency by Kurtz powder method of LAZS crystal was studied.
Keywords: L-alanine, slow evaporation, XRD, dielectric, NLO

GREEN SYNTHESIS & CHARACTERIZATION OF ALUMINIUM OXIDE NANOPARTICLES BY NEEM EXTRACTS

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ABSTRACT

The potential role of nanoparticles as future generation antibiotics and its inadequate information on the antibacterial activity of aluminium oxide has led us to synthesisealuminium oxide by leaf extracts (Neem) using eco-friendly green synthesis method. This study is mainly focused on the green synthesis of aluminium oxide nanoparticles by neem extracts leaves. By doing characterization like UV- Visible spectrometer, XRD & SEM it is confirmed that neem leaf extracts have successfully reduced sulphate in an aluminium sulphate precursor to obtain aluminium oxide nanoparticles. Synthesized aluminium oxide nanoparticles can be used for antibacterial activity.

Keywords: Aluminium oxide, Neem extract, Green synthesis.

SYNTHESIS OF ALUMINIUM OXIDE NANO PARTICLES BY MIMOSA PUDICA PLANT EXTRACT

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ABSTRACT

Mimosa pudica also called as touch me not or sensitive plant that is belongs to the mimosa genus. This plant grows as weed everywhere and used as a traditional medicine for the treatment of leprosy, dysentery and inflammations. This study will aim the synthesis of Aluminium oxide Nano particle using aluminium sulphate as a precursor material, reduced by mimosa pudica plant leaf extract. Nano particles that are produced by the plants are stable and faster. The present investigation is carried out to synthesis of alumina Nano particles by using this medicinal plant. The formation of aluminium oxide Nano particles were firstly confirmed by the inference of colour change and then by characterization instruments like, FTIR (Fourier transform infrared spectroscopy), UV-Visible spectrometer, Scanning Electron microscope and X-Ray diffractometer studies.

Keywords: Aluminium Oxide, Mimosa Pudica, Nano particles.

FABRICATION OF COST-EFFECTIVE INTERDIGITATED ELECTRODE USING COPPER CLAD WITH CERIUM OXIDE &RGO NANOCOMPOSITE AS A GAS SENSING ELEMENT

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ABSTRACT

Cerium Oxide (CeO_2) nanoparticles of approximately 30-50 nm diameter were synthesized using precipitation method. Reduced graphene oxide (rGO) was synthesized using modified Hummer's method. The thin film containing CeO_2 nanoparticles were drop casted using poly-vinyl alcohol (PVA) as matrix and mixed with reduced graphene oxide(rGO). The morphology and crystal structure of CeO_2 nanoparticles and rGO were studied by field emission scanning electron microscopy (FESEM) and X-ray diffraction (XRD) respectively. The dispersion of CeO_2 nanoparticles and rGO in PVA is studied

using UV-Vis Spectroscopy. Relative sensitivity of CeO_2 and rGO towards gas has to be determined by electrical resistance measurements.

Keywords: *CeO_2, PVA, FESEM, XRD, UV-Vis.*

FABRICATION OF COST-EFFECTIVE INTERDIGITATED ELECTRODE USING COPPER CLAD WITH CHROMIUM OXIDE &RGO NANOCOMPOSITE AS A GAS SENSING ELEMENT

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ABSTRACT

Chromium Oxide (Cr_2O_3) nanoparticles of approximately 20-40 nm diameter were synthesized using aqueous precipitation method. Reduced graphene oxide (rGO) was synthesized using modified Hummer's method. The thin film containing Cr_2O_3 nanoparticles were drop casted using poly-vinyl alcohol (PVA) as matrix and mixed with reduced graphene oxide(rGO). The morphology and crystal structure of Cr_2O_3nanoparticles and rGO were studied by field emission scanning electron microscopy (FESEM) and X-ray diffraction (XRD) respectively. The dispersion of Cr_2O_3 nanoparticles andrGO in PVA is studied using UV-Vis Spectroscopy. Relative sensitivity of Cr_2O_3 and rGO towards gas has to be determined by electrical resistance measurements.

Keywords: Cr_2O_3, *PVA, FESEM, XRD, UV-Vis.*

SYNTHESIS AND CHARACTERIZATION OF ZNO NANO METAL OXIDE FOR EFFLUENT WATER TREATMENT

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ABSTRACT

In this work, zinc oxide (ZnO) was prepared by precipitation method from zinc sulphate heptahydrate and sodium hydroxide of 1:2 ratio in presence of cetyltrimethylammonium bromide**(C**TAB) in aqueous solution at room temperature. Followed by calcination at 400^0 C for 3 hr. properties of the synthesized ZnO nanoparticles were studied by XRD, SEM. The XRD results indicated that the synthesized ZnO nanoparticleshad the pure hexagonal (wurtzite) structure with space group of P63m**c** (no. 186). Scanning electron microscopy showed that

resulted ZnO is flower type. CTAB plays significant role in the formation of flower like ZnO. Prepared nanoparticles were then subjected for the Treatment of the Effluent by Photo catalysis method. To study the effect of parameters such as initial concentration, contact time, adsorbent dose, solution pH and temperature for the removal of colouring agents and metal ions from effluent water by metal oxide nanoparticles were studied by batch adsorption techniques there by knowing the Effect of size , shape, Time, temperature and pH of the metal oxides on water purification.

ONE STEP GREEN SOLUTION PHASE SYNTHESIS OF COPPER NANOFLUIDS FOR ENHANCED THERMAL CONDUCTIVITY AND STABILITY

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ABSTRACT

Miniaturization of gadgets has necessitated the development of ultrahigh performance coolants. Nanofluid refers to the class of fluids containing stable dispersions of nanoparticles of metals or nonmetals within the base fluids. Since the properties of the nanofluids are highly sensitive to the synthesis conditions, optimization of the synthetic condition to fine tune the size, morphology, composition of the resulting nanofluid is the need of the day. Among metals copper which has higher conductivity, higher resistance to corrosion and is cost effective is the best choice as an additive to the base fluid. Herein, we employ a one step synthetic approach for preparing copper nanofluids for enhancing its thermal conductivity. Copper nanofluids are prepared by the reduction of copper acetate using fructose with 1:1 mixture of water and ethylene glycol acting as base fluid. The solution phase synthesis uses sodium lauryl sulphate as a stabilizing agent. The synthesized nanofluid is characterized by X-ray diffraction technique for phase structure, field emission scanning electron microscopy for morphology, energy dispersive X-ray spectroscopy for elemental composition. The spherical nanoparticles obtained with size ranging from 20 to 30 nm showed only a single phase with a diffraction pattern which could be indexed to face centered cubic copper (ICDD card number 04-0838). The sedimentation measurements at room temperature showed a stability of 10 weeks. The rheological measurements revealed the nanofluid to be Newtonian in nature. The synthesized

nanofluid showed a thermal conductivity of 2.1 $Wm^{-1}K^{-1}$ at 30 °C. The higher conductivity of copper, uniform and stable dispersion of the nanoparticles led to such high conductivity of the resulting nanofluid. This synthetic technique involving greener chemicals and simple approach can be very well extended to other materials and can be utilized for large scale preparation as well.

GREEN SYNTHESIS OF ZNO NANOPARTICLES FROM TINOSPORACORDIFOLIA AND THEIR USE AS A PHOTOCATALYST FOR ORGANIC DYE DEGRADATION FOR WASTE WATER TREATMENT

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ABSTRACT:

In this paper, we report the synthesis of ZnO nanoparticles using Tinosporacordifolia leaves as natural precursor via precipitation method. Formation and characterization of ZnO nanoparticles was established by UV-VIS spectroscopy, Fourier transform infrared spectroscopy, scanning electron microscopy and X-ray diffraction. The synthesized nanoparticles have hexagonal structure of an average grain size of 35 nm confirmed from X-ray diffraction analysis. The synthesized ZnO nanoparticles have been employed as photocatalytic agent to degrade the organic dye Congo red under visible light by exposing the visible light for one hour. ZnO nanoparticles degraded almost 90% of Congo red dye. The waste water was used which was contaminated by Congo red dye and microbes. We also studied the antibacterial activity and it was found that the synthesized ZnO nanoparticles have potential applications in antibacterial activity. For antibacterial studies we used Bacillus subtilis as a gram positive and Escherichia coli as gram negative bacteria.

Keywords: ZnO nanoparticles, Photocatalytic activity, Tinosporacordifolia, Green synthesis

SYNTHESIS AND CHARACTERIZATION OF ELECTROPLATED TIN MATERIAL USED AS ANODE FOR LITHIUM-ION BATTERIES

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ABSTRACT

Electrodeposition is the process in which a metallic coating deposited on a conducting surface by passing electric current through an electrolyte of desire metal. Major components of electroplating are anode, cathode and electrolyte. Stainless-steel actas an anode plate was used to clean the surface of the Cu-foil to be coated, where Cu-foil as cathode and $NaOH+NaHCO_3$ (cleaning solutions) as an electrolyte. Seven Tin samples were prepared by electroplating on a copper foil as a cathode in a two-electrode glass cell. An aqueous solution formed by tin tetrafluoroborate, boric acid, urea work as an electrolyte and tin metal as a counter electrode. When desire current was applied with known time tin gets deposited on the copper foil. By varying time and current different thickness of tin materials were obtained.The synthesized samples were characterized by using powder XRD, FE-SEM and Cyclic voltammetry. These synthesized anode materials were use for construction of button cell against lithium metal as cathode material.

SMART GARBAGE

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ABSTRACT

The main concern with the environment is waste management which in addition to disturbing the balance of the environment also has adverse effects on the health of the society. The detection, monitoring and management of wastes is one of the primary problems in present days. The traditional way of manually monitoring the wastes in waste bins is a complex, cumbersome process and utilizes more human effort, time and cost which is not compatible with the present day technologies. This project Smart Garbage is a very innovative system which will help to keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bin via a web page. By implementing this project, overflowing of garbage from the garbage bin can be avoided and garbage disposal problem can be minimized.

BINARY METAL OXIDE SNO_2-CUO NANOCOMPOSITE FOR LI-ION BATTERY APPLICATIONS

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ABSTRACT

Promising properties of metal oxide nanoparticles are projected worldwide attention for its diverse applications. In this paper, binary SnO_2-CuO nanocomposite has been prepared by ultrasonication method and analysed for lithium ion battery. Synthesised composite has been characterised through XRD, FTIR, BET-BJH, SEM-EDS and HRTEM for the confirmation of elemental presence, crystallinity, surface area, topography and elemental composition. X-ray diffraction also revealed the crystalline nature and average size of the particles is found to be about 10 and 16 nm for SnO_2 and CuO phases respectively. FTIR confirmed the presence of Sn-O-Sn and Cu - O vibrations. SnO_2-CuO anode exhibited high initial discharge capacity of 1365 mAh g^{-1} and maintained 252 mA h g^{-1} at100th cycle through C/10 rate. Stability of multistep electrochemical reversible reactions has confirmed by CV curves during the lithiation and de-lithiation process. It retained 90 mA h g^{-1} capacity at higher 2C rate. Enhancement in the electrochemical results attributed to the high surface area of 23.29 m^2/g and well dispersed nanoscaled particles.

Keywords: SnO_2-CuO nanocomposite; Ultrasonication;HRTEM; Li-ion batteries.

SI NANOWIRES FOR GAS SENSOR: SYNTHESIS, CHARACTERIZATION AND APPLICATIONS

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ABSTRACT

Nanomaterials has got excellent electrical properties as they exhibit quantum confinement. Here in this work we have used 1D semiconducting Silicon nanowires (SiNWs) which exhibit quantum effects in two dimensions and allows electron to move only in one dimension. Silicon nanowires (SiNWs) were grown by using VLS (Vapor-Liquid-Solid) growth technique. The method used is a bottom up approach of synthesis of nanomaterials. The VLS growth technique uses gold nanoparticles to activate the vapor deposition of the precursor gas and initiate a 100 nm diameter SiNWs network growth. The synthesized SiNWs were characterized by XRD, Scanning Electron Microscope (SEM) and Transmission Electron Microscope (TEM). SiNWs were integrated with resistors by fabrication and tested electrically. Electrical measurements like resistant variation before and after exposing chemical gases and humidity, IV characteristics SiNWs based resistors show the potential usefulness of these SiNWs as gas sensors.

Keywords: Silicon nanowires (SiNWs), Semiconductors, VLS growth technique, Gas sensors

NOBLE METAL NANO-PARTICLES WITH TUNABLE PLASMON RESONANCE WAVELENGTH

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ABSTRACT

In the last few years nano materials research is gaining more importance to explore the possibility of converting its special properties to end user applications. The special physical characteristics, including high surface to volume ratios, the nano-particles shows unique chemical as well as biological properties, as compared to their counterpart in bulk form. These unique properties have resulted in increased usage of nano-particles in various fields such as industry, agriculture, medicine, covering photonics to electronics, biochemical sensing to imaging. An eco-friendly and cost effective way of preparing nanomaterials is via green route, here biological agents are used to synthesis nanoparticles. In the present study, an attempt has been made to synthesize the gold and silver nano-particles (Au and Ag NPs) through green route by using mixture of spice extracts. Optical and structural properties of the nanoparticles were carried out. The UV-Vis spectra analysis shows the absorption peak at 430 nm and 530 nm, indicating the formation of silver and gold nano-particles, respectively. Interestingly, we have observed two prominent absorption peaks in optical spectra for gold at particular volume of spice extract and FESEM analysis confirms a change in shape of the gold nano-particles. A successful synthesis of Ag NPs and Au NPs was done via green route and it was found that size and shape of the particle varies with quantity of spice extract. In conclusion, the size and shape of the gold and silver nano-particles may be tuned by varying the quantity of spice extract.

NANOBIOFERTILIZERS

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ABSTRACT

Bio-fertilizers are substance applied to soil or plant surface to promote growth of plant by providing nutrients. Bio-fertilizers become an imperative to restore the soil with a beneficial microbial population. Bio-fertilizers contain live cells of specific isolated strains of bacteria and fungi which are formulated in suitable carrier. Nanotechnology is one of the promising technologies for wide range of applications in agriculture and related fields. Nanotechnology helps for the creation of advanced, low cost and environment friendly nano bio-fertilizers. Nano bio-fertilizers requires nitrogen and carbon rich sources like dry leaves, eggshells , used tea powder, flowers, wood powder, charcoal, coconut coir etc. In this present study, The soil from areca nut plantation was taken and dried, then several tests were conducted, and even water used for areca nut plantation was tested. Organic compost was prepared by using materials containing nitrogen and carbon rich sources. Using coconut coir, charcoal and agar jells, brick-shaped compost was prepared and the nano balls of compost are injected to the brick. And this brick will be used as nano bio-fertilizers. In the near future nano bio-fertilizers will play major role in Agriculture.

Key Words: Nano Bio-fertilized-Organic Compost, Coconut coir Compost.

POLY (BENZYDAMINE) MODIFIED SENSOR FOR CATECHOL IN PRESENCE OF HYDROQUINONE: A VOLTAMMETRIC STUDY

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ABSTRACT

Benzydamine was electropolymerised on the surface of carbon paste electrode by cyclic voltammetric technique. The fabricated Poly(benzydamine)MCPE showed an excellent electrocatalytic activity towards the oxidation of catechol (CC) and hydroquinone (HQ) in 0.2M phosphate buffer solution of pH 7.4 with scan rate 50mVs^{-1}. The effects of scan rate, concentration, and pH variation

were carried out electrochemically. From the scan rate study, the oxidation of catechol (CC) and hydroquinone (HQ) was found to be diffusion controlled. The pH study confirms transfer of the same electrons and protons number in the redox mechanisms. The simulations determination of CC and HQ was analysed by using the cyclic voltammetric technique. The interference studies showed that the modified electrode exhibits excellent selectivity and sensitivity. The detection limits 5.7 and 3.7μM were obtained for CC and HQ, respectively. The proposed sensor Poly(benzydamine)MCPE shows good sensitivity and selectivity towards determination of two dihydroxybenzene isomers CC and HQ individually and simultaneously.

Keywords: Catechol, hydroquinone, Benzydamine, Cyclic Voltammetry,Electropolymerisation, Carbon Paste Electrode.

A STUDY ON SYNTHESIS AND CHARACTERIZATION OF POLYMER/ZNO NANOCOMPOSITES

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ABSTRACT

Polymer nanocomposites have recently attracted considerable interest because of their excellent structural, mechanical and electronic properties which leads to potential applications in nano-electronic devices. Experimentally introducing inorganic nanoparticles into conducting polymer matrix could significantly improve the mechanical and electrical properties of the polymer matrix. Inorganic semiconductor ZnO (Zinc Oxide) is gaining lot of applications because of its exceptional characteristics, such as wide band gap (3.37 eV) and large exciton binding energy (60meV) at room temperature. Because of these properties, it has been comprehensively studied to produce optical and electronic devices such as LEDs (Light Emitting Diodes), Solar cell, transducers, Photo-detectors etc. When this inorganic semiconductor ZnO is added in polymer matrix it gives improved physical and chemical properties. These improved characteristics pertain to various electronics applications. This research paper provides an overview of different polymer matrix containing inorganic ZnO nanoparticles also offers a comprehensive discussion on technology, modeling, characterization, processing, production, applications of polymer nanocomposites. Important research findings on Polymer-ZnO nanocomposite have been discussed.

Keywords—Polymers, ZnO, Nanocomposites

ULTRA-SONICATED CUO-NIO NANOCOMPOSITE FOR PHOTOCATALYTIC ACTIVITY AND ANTIBACTERIAL STUDIES

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ABSTRACT

CuO-NiO nanocomposite was prepared by ultra-sonication method. The composite nanoparticles (NPs) were characterized by XRD, FTIR, UV-DRS and SEM with EDS for photocatalytic degradation and antibacterial studies. XRD data indicated that the formation of monoclinic and hexagonal crystallite structures for CuO and NiO respectively. FTIR confirmed the presence of Cu - O and Ni - O molecular vibrations. Surface morphology and elemental composition of composite was analysed by SEM with EDS. CuO-NiO NPs acts as good photocatalytic material towards the Methylene blue (MB) dye degradation compared to individual metal oxides under the UV light interaction. CuO and NiO NPs also exhibit significant antibactericidal activity against gram +ve*S. aureus* and gram –ve*P. Aeruginosa* bacteria's. CuO-NiO composite NPs possess good photocatalytic as well as antibacterial activity.

Key words: CuO-NiO NPs; Ultrasonication method; Photocatalytic activity; antibacterial activity;

DYE DEGRADATION OF CONGO RED BY MOS_2 AND TIO_2 NANOCOMPOSITES

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ABSTRACT

The chemical synthesis of nanoparticles is economic and doesn't require high energy consumption machineries. The textile industries produce abundant amount of wastage every year which may lead to global warming or harmful to aquatic animals. In this work significant attempt has made to for synthesis of MoS_2 by hydrothermal synthesis and TiO_2 nanoparticles by chemical method and use them to degrade the Congo red dye. The synthesized MoS_2 and TiO_2 nanoparticles were characterized by UV visible spectrophotometer for primary confirmation and XRD for structural analysis. The Scanning Electron Microscope and Transmission Electron Microscope revealed the size of synthesized MoS_2 nanoparticles

were of 30-40 nm and TiO_2 nanoparticles were of size 50-60 nm. Then the MoS_2 and TiO_2 nanoparticles were incorporated into the dye and observed the dye degradation phenomena by observing colour change.

Keywords: MoS_2 and TiO_2 nanoparticles, Congo red dye, Dye degradation, hydrothermal synthesis.

ELECTROCHEMICAL STUDIES OF DRUG INTERMEDIATE 4-CHLORO,8-(TRIFLUORO METHYL) QUINOLINE FOR MILD STEEL IN 1M HCL SOLUTION

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ABSTRACT

Corrosion inhibition of mild steel by a 4-Chloro,8-(TrifluoroMethyl) Quinolinehas been investigated by using electrochemical methods such as polarization and electrochemical impedance techniques. The experimental results suggested that, 4-Chloro,8-(TrifluoroMethyl) Quinoline is a good corrosion inhibitor for mild steel in 1M Hydrochloric acid medium at 303 K.The surface morphology of steel surface was studied by scanning electron microscopy (SEM).

Keywords:4-Chloro,8-(TrifluoroMethyl) Quinoline, Inhibitor; SEM; Polarisation.

NOVEL ANTIPSORIATIC TOPICAL ETHOSOMAL GEL CONTAINING METHOTREXATE

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ABSTRACT:

The purpose of the study was to formulate effective Methotrexate ethosomal gel formulations. Methotrexate, a hydrophobic drug is used in the treatment of psoriasis which is encapsulated in nanosize ethosomes. Methotrexate was encapsulated in ethosomal suspension. Then it was incorporated into gel using carbopol as gelling agent. In this study, the ethosomal suspension containing methotrexate were prepared using various phospholipids and ethanol concentration and their characteristics such as surface morphology, particle size analysis, zeta potential, entrapment efficiency etc were evaluated. Entrapment efficiency of the formulation 2 formulation containing 3 ml soya lecithin and 40 ml of ethanol was found to be 77% which is higher than the other five formulations. The *in vitro* release study of the F2 formualtion was found to be 71.1% at 12hr. It was incorporated into carbopol 934 gel to make 1% of Methotrexate ethosomal gel . The prepared gel was then evaluated for its parameters

like physical appearance, pH, drug content, spreadability, viscosity, *In-vitro* diffusion studies and Kinetic studies. The *in vitro* diffusion studies of Methotrexate ethosomal gel was found be 81% at 16hr. The stability studies of the ethosomal gel was carried out as per as ICH guidelines at 25±5ºC at (60±5%RH) and 4±2ºC. From the present study it can be concluded that ethosomes have higher permeability of the drug and can be used in the topical treatment of Psoriasis.

Key words: Methotrexate, Ethosomes, Phospholipids, Gel .

3D PRINITING OF DENTAL IMPLANT DESIGN MODIFICATION

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Osseo integration is the ultimate goal of a dentist, after placement of dental implants. In some cases achieving optimal levels of Osseo integration becomes questionable in case of areas needing additional soft and hard tissue grafting as well as implants placed in the posterior maxillary region.If a design modification can be applied to the Currently used dental implant the problems like the additional grafting procedures and the cost involved in the same as well as the time taken in performing the additional surgeries can be reduced.This paper describes one such design modification of the currently used dental implants.

MICROWAVE PROPERTIES OF GAMMA IRRADIATED MG-ZN FERRITE.

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ABSTRACT

Ferrites are the special class of ceramics which exhibit the properties of magnetic semiconductor. Magnesium zinc ferrite sample was prepared by conventional solid state technique. Structural characterizations were confirmed by X ray diffraction analysis. Particle size calculated by Scherer method and found to be in the order of nano scale. Surface analyses were done by Scanning electron microscope. Electrical conductivity of gamma irradiated samples was studied at room temperature. The microwave properties (complex permittivity and permeability were measure in the frequency range 8-13 GHz. The real and imaginary part of both permeability and permittivity are found to be decreases with increasing frequency in microwave region.

Key words : Mn-Zn ferrite, gamma irradiation, micro waves, properties

DYE DEGRADATION OF CONGO RED BY MOS_2 AND TIO_2 NANOCOMPOSITES

Zubear Khan[1], Darshanram H.[1], Sanjay G.[1], Ravika Patil[1], Abhinaya Nellirichale[1], Prasad Puthiyillam[1,2], Shareefraza J. Ukkund[* 1,2]

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ABSTRACT

The chemical synthesis of nanoparticles is economic and doesn't require high energy consumption machineries. The textile industries produce abundant amount of wastage every year which may lead to global warming or harmful to aquatic animals. In this work significant attempt has made to for synthesis of MoS_2 by hydrothermal synthesis and TiO_2 nanoparticles by chemical method and use them to degrade the Congo red dye. The synthesized MoS_2 and TiO_2 nanoparticles were characterized by UV visible spectrophotometer for primary confirmation and XRD for structural analysis. The Scanning Electron Microscope and Transmission Electron Microscope revealed the size of synthesized MoS_2 nanoparticles were of 30-40 nm and TiO_2 nanoparticles were of size 50-60 nm. Then the MoS_2 and TiO_2 nanoparticles were incorporated into the dye and observed the dye degradation phenomena by observing colour change.

Keywords: MoS_2 and TiO_2 nanoparticles, Congo red dye, Dye degradation, hydrothermal synthesis.

REVIEW OF THE PROCESS AND USE OF CLASSIFICATION AND REGRESSION TREE METHOD IN NURSING RESEARCH

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ABSTRACT

Aim : This paper presents a review of Classification and Regression tree analysis and its use in nursing research

Background : Classification and Regression Tree analysis is an exploratory research method used to show association between variables unsuited to traditional regression analysis. Intricate interactions are shown between covariates and variables of interest in Inverted tree diagrams

Design Review

Data Sources.

English language literature was sourced from Ebooks, Medline Complete and CINAHL plus databases, Google and Google Scholar , hard copy research texts and retrieved reference lists for terms including Classification and Regression Tree and derivatives and recursive partitioning from 1984-2013.

Review – Classification and Review Tree is an important method to identify previously unknown patterns among data. The reasons to adopt this method is for quantitative research issues regarding data quality and its usefulness and validity of findings should be considered.

Impact on Nursing Research

Classification and Regression Tree analysis is an important method to guide nurses to minimize gaps in applications of evidence to practice. With ever-increasing data availability it is important for nurses to understand the use and limitation of research method.

Conclusion – Classification and Regression Tree is an easy interpreted method to model interactions between health related variables. A graphical representation of knowledge is presented, giving insightful understanding of intricate and hierarchical relationships in an accessible and useful way to nursing and other health professions.

Keywords : Classification Tree , data analysis , data mining, decision tree, nursing research, recursive partitioning , regression tree, research method.

RAPID SYNTHESIS OF SILVER NANOPARTICLES FROM HIBISCUS FLOWER EXTRACT BY MICROWAVE METHOD AND THEIR ANTIBACTERIAL STUDIES

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ABSTRACT

The silver nanoparticles can be synthesized by chemical, physical and biological routes. Among the three methods employed, the biological method is eco-friendly, economic and non-toxic approach. Silver nanoparticles were synthesized by using Hibiscus flower extract. Hibiscus flower extract is well known for medical applications including pharmaceuticals and cosmetics. The synthesized silver nanoparticles were characterized by UV-Spectrophotometer for primary conformation. The silver nanoparticles were then subjected to XRD, FTIR, EDAX, SEM and AFM analysis. The XRD results confirmed the nanostructures formed were FCC structure. FTIR and EDAX studies verified the presence of Ag nanoparticles. The SEM and AFM result showed silver nanoparticles formed were of size 60-75 nm. The silver nanoparticles were later conjugated with 4 antibiotics and subjected to zone of inhibition test which confirmed the improvement of efficiency of antibiotics against both gram positive and negative bacteria.

Keywords: Green synthesis, Hibiscus flower, Antibacterial activity, Silver nanoparticles, Antibiotics.

NANOFILTER FOR DESALINATION OF WATER USING $MoOS_2$ NANOPORES AND SILVER NANOPARTICLES

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ABSTRACT

The major problem of world is lack of fresh water and many reports shows that the world will face severe problem in the future. Nanotechnology is providing some of the solutions to remove salt content in the water by using grapheme and carbon nanotubes led to the development of a variety of nanoporous membranes for water purification. In our work significant attempt has been made to remove salt content. By performing molecular dynamics simulations we can show that a nanopore in a single-layer molybdenum disulfide can effectively reject ions and allow transport of water at a high rate. More than 78% of ions are rejected by membranes having pore areas ranging from 40 to 80 $Å^2$. Water flux is found to be two orders of magnitude greater than that of other known nanoporous membranes. Pore chemistry is shown to play a significant role in modulating the water flux. Pores with only molybdenum atoms on their edges lead to higher fluxes, which are around 50% greater than that of graphene nanopores. These observations are explained by permeation coefficients, water density and velocity distributions in the pores. The silver nanoparticles were also coated on the filter which shown a greater antibacterial properties through zone of inhibition studies. These silver nanoparticles helped in the removal of microbes presented in the salt water in this way along with removal of salt we were able to kill the microbes.

Keywords: Desalination, Water purification, MoS_2 nanopores, Silver nanoparticles, permeation coefficients.

FABRICATION AND TESTING OF SOLAR POWERED IRRIGATION SYSTEM BY USING CRANK AND LEVER MECHANISM

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ABSTRACT

The intent of this project work is to provide general guidance on the design of small solar-powered water pump systems for use with livestock operations or irrigation systems. This work aims to provide a review of the basic elements of electricity, a description of the different components of solar-powered water pump systems, important planning considerations, and general guidance on designing a solar-powered water pumping system by using crank and lever mechanism. This also provides design examples for typical design models and standard drawings for use. This system consists of solar powered water pump along with an automatic water flow control using a moisture sensor and GSM system. It is the proposed solution for the present energy crisis for the Indian farmers. When the moisture content of the soil is reduced then the sensor sends detected value to the microcontroller. Then the water pump is automatically ON according to the moisture level. The main aim of this project is to reduce the human intervention for farmers and use solar energy for irrigation purpose and improvements in rural area by using lakes for irrigation purposes. In addition, the system is powered by an intelligent solar system in which solar panel targets the radiation from the Sun. Other than that, the solar system has reduced energy cost as well as pollution. The system is equipped with two input sensors; two soil moisture sensors. Soil moisture sensor measures the humidity of the soil.

TESLA COIL WIRELESS POWER TRANSMISSION SYSTEM

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ABSTRACT

The intent of this project is to present design of wireless power transmission using tesla coil. While travelling on the long routes most of our youth is more comfortable with mp3 players, headphones and smart phones. Also now a day's smart phone are essential for cashless purpose. But the main issue with smart phone are there battery running down. We are not able

to carry the charger everywhere and finding the place for charging the smart phones. Here started the new era of technology **'Wireless Power Transmission'**. The project describes the importance of wireless power transmission in future days. There are two ways of electrical energy transmission one is wired and other is wireless. Wired electric transmission is complicated in design, easy way to overcome this disadvantage by using wireless transmission.

BIOCOMPATIBLE RAZMA SEEDS ASSISTED CUO NANOPARTICLES FOR ANTIBACTERIAL AND PHOTOCATALYTIC DEGRADATION STUDIES

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ABSTRACT

Copper oxide nanoparticles (CuO NPs) were synthesized by solution combustion method using razma seed extract as fuel. The structure and morphology of the product was characterized by XRD, FTIR, RAMAN, UV- DRS, SEM with EDAX, TEM and PL Spectroscopy. The nanoparticles were subjected to photocatalytic activity. Biological activities such as antimicrobial studies were also studied. XRD pattern demonstrated the formed product belongs to monoclinic phase with crystallite structure. SEM images show that the particles are agglomerated to form sponge like structure and the average crystallite sizes were found to be ~ 17- 23 nm by Scherrer's method. PL spectra exhibited 4 emission edges at 441, 461, 493, 543 nm upon excitation at 335 nm because of oxygen deficiencies. The prepared CuO NPs exhibit excellent photocatalytic activity for the photodegradation of methylene blue (MB) indicating that the CuO NPs are photocatalytic semiconductor materials. CuO NPs exhibit significant bactericidal activity against *Klebsiella aerogenes*, *E.coli* using the agar well diffusion method, furthermore, this study was successfully demonstrated the synthesis of CuO NPs by simple ecofriendly route employing razma seeds extract as fuel that exhibit photodegradative, and antibacterial activities.

Key words: CuO, Solution combustion, TEM, Photocatalytic activity, PL and Antibacterial

SYNTHESIS AND STUDIES OF OPTICAL AND PHYSICAL PROPERTIES OF HOLMIUM (Ho^{3+}) IONS DOPED BISMUTH – TELLURITE GLASSES

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ABSTRACT

Rare earth doped bismuth tellurite glasses have currently been attracting the attention of many researchers as optical device and laser material. In the present work, Holmium doped bismuth - tellurite glasses have been prepared through conventional melt quenching method. Non crystalline structure of glasses was confirmed with the aid of X-Ray Diffractrometer measurements. Physical properties such as density and molar volume have been investigated by applying suitable formulae and the values procured provide the information about the structural stability of glass samples. The influence of Ho^{3+} ions on the optical properties of bismuth - tellurite glasses was studied through UV-visible region of wavelength 200-1100 nm absorption spectra were recorded at the room temperature. The Urbach energy and optical energy bandgap values are described by resources of Davis–Mott method. The refractive index of all the prepared glass samples is also measured and these values are used to determine the corresponding molar refraction, molecular polarizability of oxide ions by making use of appropriate mathematical relations. By means of the absorption edge studies, the values of optical bandgap energies have been estimated. The studied glasses show evidence of highest refractive index as 2.695 and the direct band gap energy values ranges from 2.097 to 2.675 eV. With respect to small variation of holmium (Ho^{3+}) ion concentration the non-linear variations of the above optical parameters were discussed and results demonstrate the advantages of bismuth tellurite glass as new candidate for optical device and laser material.

Keywords: Bismuth – Tellurite glass; Optical energy band gap; Refractive index; Urbach energy

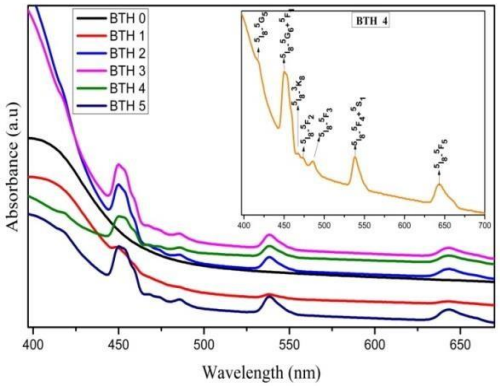

Fig. Optical Absorption spectra of the Ho^{3+} doped boro bismuth tellurite glasses

ELECTROCHEMICAL INVESTIGATION OF TETRANITRO COBALT PHTHALOCYANINE ON CORROSION CONTROL OF MILD STEEL IN HYDROCHLORIC ACID MEDIUM

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ABSTRACT

Tetranitro cobalt phthalocyanine (TNCoPc) was used as a corrosion inhibition of mild steel in a 0.25 M hydrochloric acid medium using Tafel polarization and electrochemical impedance spectroscopy in a temperature range of 303 to 323K. The concentration of inhibitor used was in the range of 1.25 – 5 mM. The surface morphology was studied using scanning electron microscopy, atomic force microscopy, and energy dispersive X-ray analysis. The inhibition efficiency was found to increase with increasing inhibitor concentration and decreasing temperature. Polarization studies revealed that TNCoPc acts as a mixed type inhibitor at all concentrations of it. The maximal inhibition efficiency of 86.48 % was obtained with TNCoPc at its optimum concentration of 5mM. Adsorption studies revealed that the adsorption of this inhibitor underwent both physisorption and chemisorption on the surface of the metal and followed the Langmuir adsorption isotherm. The kinetic and thermodynamic parameters were calculated and discussed in detail. The results obtained by both Tafel polarization and electrochemical impedance spectroscopy methods were in good agreement with each other. TNCoPc emerged as a potential inhibitor for the corrosion control of mild steel in a hydrochloric acid medium.

Keywords: Mild steel, green inhibitor, Tetranitro cobalt phthalocyanine, Tafel polarization, electrochemical impedance spectroscopy, scanning electron microscopy

MONITORING OF AGRICULTURAL CROPS USING WIRELESS SENSOR NETWORK TECHNOLOGY

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ABSTRACT

The main purpose of this paper to recognize several micro nutrients and macronutrients present in the soil by deploying chemical sensors in a different locations in the crop field. And it collects data and the range of different soil nutrients and transmits to the data server through the wireless sensor networks. The chemical level of the soil is monitored by the sensors and data is transmitted over the wireless channel to the farmer's system through which he can timely get the knowledge of chemical level in the soil in his field and accordingly he can apply fertilizers to his farm. The application of commercial N, P, and K fertilizers has contributed to a tremendous increase in yields of agricultural crops. However, excessive use of these fertilizers has been cited as a source of contamination of surface and groundwater. There are different stages in crop growing and each step requires different nutrient levels. Therefore, a farmer has to spend a lot of time in monitoring the fields. There are various techniques are available to measure soil nutrients level, farmers can improve the crop production. Because insufficient nutrient levels can unhelpfully affect crop production.

Keywords: Wireless Sensor Networks, Soil nutrient and its sensors, Agriculture, Crop productivity.

STATUS OF AMBIENT AIR QUALITY IN CHITRADURGA

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ABSTRACT

The air we breath, the water we drink and the food we eat are all contaminated. Therefore, they require thorough analysis by modern tool of analytical chemistry in order to know their status.

DUAL INTAKE SYSTEM IN TWO-STROKE ENGINE

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ABSTRACT

Small capacity two stroke engines are used for several applications in spite of their considerable short circuiting losses, which are responsible for high fuel consumption and enormous HC and CO emissions Stringent emission laws, in consequent to environmental concerns and the need for more efficient and economical engines, have led to reduce fuel losses and pollutant emissions. Unfortunately small two stroke engine manufacture are less willing to replace the existing two stroke engines due to increased expenditure and lack of alternatives. A ball valve assembly can contribute to reaching the above mentioned goals by providing a means for easy and neat scavenging processes in two stroke engines. In this arrangement, the transfer port is fitted with a ball valve. During the expansion stroke when piston uncovers the transfer port the pre heated air enters the combustion chamber, instead of air fuel mixture doing the process. As a result of this complete combustion of air fuel mixture can be ensured and escape of fresh charge through exhaust port without undergoing combustion process can be avoided. Thus the unburned fuel which comes along with the exhaust gases can be considerably reduced thus reducing exhaust emissions.

Keywords: two stroke engines, ball valve, pollutant emissions, piston, HC and CO emissions.

EFFECT OF BURR HEIGHT IN DRILLING LOW CARBON STEELS FOR DIFFERENT DRILL POINT ANGLES

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ABSTRACT

In the present work low carbon steel have been used to observe the burr height at the exit end of the work piece of a drilled hole under different machining conditions. Three uncoated 12mm diameter HSS twist drills are used. These drills have different drill point angles i.e. 1180, 1000, 800. All the experiments are carried out on a CNC milling machine with and without the application of coolant. Cutting speed and feed are chosen within the range of 20-31m/min and 0.032-0.08mm/rev respectively. Ranges of cutting speed and feed are selected considering usual industrial practice for drilling mild steel with HSS drill bit. The result from these set of experiment reveal that the increase in cutting speed increases the burr height at given feed rates in both the cases of drilling without coolant and with coolant. An increase in feed rate generated less burr height values at a given cutting speed. It was observed that the drill bit having a point angle of 1180 produced the least burr for the drilling with and without the use of coolant. The validation of the experiment results is done using ANN. The neural network algorithm with the three layers is applied to model the experimental burr height for the drill point angle The ANN values matched very well the experimental results.

Keywords: Burrs, Burr Height, HSS Drill Bit, CNC, ANN

A STUDY ON NANO COATINGS FOR BIODEGRADABLE DENTAL DRAPES DESIGN

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ABSTRACT

The objective is to find suitable nano-coatings that can provide good water-resistant properties for the dental drapes. The dental drapes made up of wood powder, banana fiber and epoxy have inferior water-resistant properties. Biodegradable drapes cost per use decreases drastically if they are reusable. Hence nano-coated drapes will bring superior water-resistant properties to drapes and also decrease cost per use. It was evident that composites made up of wood powder, banana fiber and epoxy were vulnerable to water, whereas nano-coatings demonstrate good water resistance and fire resistance even after water immersion.

Keywords: Dental drapes design, nano-technology, Composites, Wood powder, Banana fiber, Epoxy.

AGRICULTURE CROP PREDICTION USING MACHINE LEARNING

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ABSTRACT

Looking at the current situation faced by farmers in Maharashtra, we have observed that there is an increase in suicide rate over the years. The reasons behind this includes weather conditions, debt, family issues and frequent change in Indian government norms. Sometimes farmers are not aware about the crop which suits their soil quality, soil nutrients and soil composition. The work proposes to help farmers check the soil quality depending on the analysis done based on data mining approach. Thus, the system focuses on checking the soil quality to predict the crop suitable for cultivation according to their soil type and maximize the crop yield with recommending appropriate fertilizer.

SYNTHESIS AND CHARACTERIZATION OF ETHYL 4-ACETOXY-3-OXOBUTANOATE FOR THE SYNTHESIS OF FURAN-2,4(3H, 5H)-DIONE

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ABSTRACT

In present work, we synthesized ethyl 4-acetoxy-3-oxobutanoate which have a significant role in the pharmaceutical industry and a key intermediate in several biologically active natural products. Using this intermediate, we have tried to synthesize furan-2,4(3H,s5H)dione, a natural product used as insecticides, antioxidants and anti-inflammatory compounds. Characterization using FTIR, 1H NMR, 13C NMR and Mass spectra showed the successful synthesis of ethyl 4-acetoxy-3-oxobutanoate. The reagents and conditions used to produce furan-2,4(3H,5H)-dione was unsuccessful because of cyclization of ethyl 4-acetoxy-3oxobutanoate was not promoted at acid medium.

SYNTHESIS AND CHARACTERIZATION OF N-(4-METHOXYPHENYL)-NMETHYL-3-PHENYLPROPIOLAMIDES

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ABSTRACT

The Carboxylic acid amine coupling reaction is of more fundamental reaction for the synthesis of amides. In the present work we report synthesis of propiolamides from phenyl propiolic acid with N-methyl-p-anisidine using HBTU under nitrogen atmosphere. Propiolamides are very important scaffolds and utilized for the synthesis of various organic derivatives. We prepared compounds viz, N-(4-methoxyphenyl)-N-methyl-3-(ptolyl)propiolamide, 3-(4-acetylphenyl)-N-(4-methoxyphenyl)-N-methylpropiolamide and characterized by using 1HNMR, 13CNMR, HRMS and IR spectroscopic techniques. Recently N-phenyl propiolamides are utilized to derive spirocyclic and hetyerocyclic compounds namely such as Azaspirotrienone1 and Oxindole 2. We wish to utilize the synthesized propiolamides to develop a novel method for the various type of cyclization reactions which has not yet been reported.

Keywords: HBTU, p-Anisidine, Amines and Acids

SYNTHESIS AND CHARACTERIZATION OF P-(4-SUBSTITUTEDPHENYL)-ACETOPHENONE BY SUZUKI COUPLING REACTION

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ABSTRACT

Carbon is by nature a stable element and thus, it do not easily react with one another. However, Pd-catalyzed cross coupling reactions are effective in making C-C bonds. Suzuki reaction has been extensively utilized in the synthesis of making Carbon molecules including the most complex one. The present work summarizes the synthesis of different derivatives of biphenyls as agrochemical intermediates and their characterization. The compounds p-(4-methylphenyl)acetophenone and p-(4-methoxyphenyl)-acetophenone were prepared by the coupling of corresponding aryl boronic acids with 4-ketoaryl halides in the presence of base and a solvent. The synthesized compounds were characterized by 1H NMR and GCMS.

Key Words: Suzuki reaction, palladium, aryl boronic acid, aryl halides and agrochemical intermediates.

SYNTHESIS AND CHARACTERIZATION OF TRIPHENYLENE INTERMEDIATES FOR DISCOTIC LIQUID CRYSTALS

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ABSTRACT:

Triphenylene as a novel core for discotic liquid crystals has remained the focus of considerable attention of liquid crystal scientists for a number of reasons such as thermal stability, fairly accessible chemistry, variety of mesophase and their one-dimensional charge and energy migration properties. Triphenylene derivatives have also been recognized as interesting materials for molecular scale devices, molecular receptors, etc. Electrophilic aromatic substitution in unsubstituted triphenylene yields different derivatives of triphenylene leading to synthesis of variety of novel discotic liquid crystal. Here the synthesis of a number of these intermediates which can be used as a precursor to design novel discotic liquid crystalline materials is mentioned. Unsubstituted hexabutyloxy and hexadodecyloxy triphenylenes have been nitrated under suitable conditions to give mono, tri nitrated triphenylenes. This mono and trinitrated triphenelyes were further reduced catalytically to give mono and triamine triphenylene molecules. The purity of all these intermediates was confirmed using H1NMR, C13NMR, and Elemental analysis. Thermal behavior of these molecules were studied using differential scanning calorimeter and some of them are found to be liquid crystalline. The liquid crystal properties are further studied using Polarizing optical microscope and X-ray diffraction techniques. These intermediates will be used to make novel discotic liquid crystalline materials.

"SYNTHESIS OF HANTSZCH ESTER AND ITS APPLICATION FOR THE SYNTHESIS OF DIBENZYLAMINE''

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ABSTRACT

1,4-Dihydropyridines (DHPs) belongs to the class of nitrogen containing heterocycles having a six-member ring. The Hantszch Ester or Hantszch dihydropyridine synthesis is a multicomponent organic reaction between an aldehyde such as formaldehyde, two equivalents

of a β-keto ester such as ethyl acetoacetate and a nitrogen donor such as ammonium acetate or ammonia. We synthesised Hantszch ester by condensation of aldehyde, methylacetoacetate and ammonium acetate. In this study we synthesized series of Hantszch ester derivatives and Characterized by GCMS. These Hantszch esters were further used for reductive amination reactions by treating with benzaldehyde to get the desired Dibenzylamine. Here Hantzsch ester is used as a reductive agent for the reduction of dibenzylamine. Dibenzylamine motifs are found in many important chemical materials, dyes and drug candidates. Such as rubber vulcanizing agent, chemical dyes and intermediate of photodynamic drugs.

Key words: Hantzsch ester, Dibenzylamine

SYNTHESIS AND CHARACTERIZATION OF AZO-FUNCTIONALISED LIQUID CRYSTALLINE COMPOUNDS

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ABSTRACT

A novel series of azo-functionalised liquid crystalline compounds was synthesised and characterised by 1H NMR and FT-IR. Five compounds in this series were prepared by varying the alkyloxy chain lengths from –OC4H9 to –OC12H25 at one end of the molecule and the chain length at the other end was kept constant as –OC10H21. The mesomorphic properties of these azo compounds were studied using polarising optical microscopy (POM), differential scanning Calorimeter (DSC). The study revealed that these compounds form SmA and SmC mesophases. A qualitative investigation on the photosensitivity of these compounds was performed using UV-Vis spectral studies. The sharp peaks observed in DSC indicate the high purity of the synthesized compounds.

Key words: azo compound; alkyloxy chain length; polarising optical microscopy; mesophase; photosensitivity.

SYNTHESIS AND ANTIMICROBIAL EVALUATION OF NOVEL 4-AMINO-6-(1,3,4-OXADIAZOLO/1,3,4-THIADIAZOLO)-PYRIMIDINE DERIVATIVES

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ABSTRACT

Pyrimidine plays an important role in medicinal chemistry due to their diverse pharmacological properties. Pyrimidine is present in cytosine, adenine, guanine and thiamine which form part of DNA and RNA, vitamins and co-enzymes. Pyrimidine derivatives show an excellent biological profile as therapeutic agents (i.e., anti HIV, antimalarial, anticancer, antiviral, antibacterial, antifungal), against certain diseases (e.g., cardiovascular, central nervous system activity) and as analgesics.

Oxadiazole/thiadiazole drugs are effective chemotherapeutic agents for the prevention and cure of bacterial infections in human beings. A literature survey revealed that 1,3,4-oxadiazole derivatives play an important role in medicinal chemistry because of their significant biological properties such as antibacterial, anti-inflammatory, anticancer, analgesic and CNS depressant.

The synthesis of several 4-amino-6-(1,3,4-oxadiazolo/1,3,4-thiadiazolo)-pyrimidine derivatives have been taken up owing to their promising biological activities

A REVIEW OF TRACKING APPROACHES FOR NOISY TARGETS.

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ABSTRACT

Visual object tracking is an actively researched computer vision problem with various real-world applications in surveillance and security, motion-based recognition, robotics and autonomous vehicles. This paper is a review of the latest trends and advances in the tracking algorithms and evaluation of trackers in the presence of noise. The first part of this work comprises a broad survey of recently proposed tracking algorithms. Broadly trackers are classified into correlation filter based trackers and the others as non-correlation filter trackers. Further classification into various types of trackers based on the architecture of tracking mechanism is done here. In the second part of this work, experimental evaluation of trackers for robustness in the presence of additive white Gaussian noise is presented. Performance degradation shown by various trackers is compared. The study concludes that a single tracker may not be able to achieve the same efficiency in the presence of noise as under noise-free conditions. For tracking algorithms a parameter for robustness to noise is to be included
Keywords—Visual Object Tracking, Surveillance, Security, Tracking Evaluation, Correlation filters, Robustness of Trackers.

DESIGN OPTIMIZATION OF POWER MANIPULATOR GRIPPER FOR MAXIMUM GRIP FORCE

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ABSTRACT

Master Slave manipulators need a gripper with at least 2 Degree of Freedom (DOF). Gripper is used as end effector to carry out complex task in the constrained work spaces. The power manipulator (PM) is one such master slave which reduces the operator load and stress with a power multiplication of 2 to 4 times. The present PM under consideration has a payload capacity of 25 kgf. The grippers used are subjected to higher grip forces than the payloads as

they have to use the friction forces to hold. The grippers are designed to have links translating the forces from the motors present above the wrist. If the links are not properly connected and positioned, the performance of the gripper will be affected very badly reflecting a very low payload capacity. This paper deals with the modeling of the gripper for the static force analysis in all possible configurations and also the velocity profile, acceleration profile and force analysis of the links in the gripper jaw. The movement of gripper jaws is actuated by screw driven AC servo motor. Gripper force needs to be found to lift a weight up to 25kg-f payload. The optimization of the gripper can be obtained for various parametric values, aiming for all the positions of gripper jaw; the grip force remains same.

Keywords: Power Manipulator, Gripper force, in-cell manipulator.

IRON DOPED ALUMINUM OXIDE BASED MIXED MATRIX MEMBRANE FOR ANTIFOULING STUDY

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ABSTRACT:

In this study, Iron Doped Aluminum Oxide(Fe:Al_2O_3) nanoparticle have been prepared by using solution combustion method. Fe:Al_2O_3 nanoparticle was prepared by using stoichiometric amount of Aluminum nitrate nonahydrate, Ferric nitrate nonahydrate and Sucrose. Fe:Al_2O_3 nanoparticles and polysulfone (PSf) mixed matrix membrane was prepared by phase inversion method. The nanoparticles and mixed matrix membranes were characterised by Powder X-Ray diffraction, scanning electron microscopy, Energy- dispersive X-ray spectroscopy. Brunner- Emmett-Teller (BET) technique was used to study the surface area of the nanoparticles. Finally the membrane porosity, hydrophilicity, water uptake capacity and porosity have been performed. In addition of nanoparticles enhances membrane property along with better improvement in membrane fouling.

Key Words: Iron doped aluminium oxide (Fe:Al_2O_3) nanoparticles, Mixed matrix membranes, Hydrophilicity, Anti-fouling study.

COBALT NICKEL SULPHIDE: AN EFFICIENT PSEUDOCAPACITIVE MATERIAL FOR HIGH PERFORMANCE SUPERCAPACITOR APPLICATION

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ABSTRACT

A tremendous rise in the energy demand because of increasing population has made researchers across the globe to focus more on energy storage devices [1]. Batteries lack in offering high power density and cycle life and capacitors lag behind in offereing high energy which gave birth to an era of 'Supercapacitors' which are a major attraction nowadays towards the efficient energy storage as they are on full swing by providing very high power density, reasonably good energy density [2], high cycle life and fast charge-discharge mechanism offereing unusually high specific capacitance which is the need of the hour! In the present work, efforts have been put to come up with electrode materials for supercapacitors which will enhance the properties for the better performance. Binary metal oxides and chalcogenides [3] are considered as well-known materials for pseudocapacitors. Herein, Cobalt Nickel Double Hydroxide (CNDH), Cobalt Nickel Oxide (CNO) and Cobalt Nickel Sulphide (CNS) were synthesized by using a facile solvothermal method and characterized using various techniques such as Field Emission Scanning Electron Microscopy (FESEM), X-ray Diffraction analysis (XRD), etc and studies [2] were performed using Cyclic Voltammetry (CV) and Galvanostatic Charge-Discharge (GCD) for performance studies. The specific capacitance was found to be quite good i.e., 1300 F/g at a current density of 1 A/g for the synthesized CNS and also electrochemical studies were carried out for the synthesized CNDH, CNO and CNS for performnace evaluation and comparison.

BMS-986163, A POTENT AND SELECTIVE NEGATIVE ALLOSTERIC MODULATOR OF GLUN2B WITH POTENTIAL UTILITY IN MAJOR DEPRESSIVE DISORDER

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ABSTRACT

Major depressive disorder (MDD) is a debilitating psychiatric condition affecting more than 350 million people in worldwide. Treatment typically includes a combination of psychotherapy and antidepressant medications. Most of the commonly prescribed antidepressants modulate monoamine neurotransmitters and can require several weeks of repeat dosing to reach full therapy effect. Unfortunately, 20-30% of MAD patients failed to achieve an adequate response to multiple courses of drug therapy and may be diagnosed with treatment-resistant depression (TRD). Consequently, there is clear and present need for the discovery of more efficacious and rapidly acting antidepressants. Towards this end, negative allosteric modulators of GluN2B have shown antidepressant activity in patients with treatment- resistant major depressive disorder Among several reported GluN2B selective NAMs, the structural feature of Ifenprodil consists of two nonpolar aromatic rings coupled by a linker that usually contains basic nitrogen. Guided by the pharmacophore model, we designed and prepared a variety of novel GluN2B NAMs with heteroatom containing linkers having non-planar conformational restrictions that might impart superior selectivity and retain drug like properties. From this exploration we have identified compound **2** which shown potent rat GluN2B binding affinity (Ki = 1.4 nM) and robust inhibition of GluN1/GluN2B receptor function (IC50 = 4.2 nM). But this compound showed significant inhibition of the human ether-a-gogo-related gene (hERG IC50 = 620 nM) due to a basic nitrogen flanked by aromatic or hydrophobic groups. The basicity of nitrogen was reduced by incorporating fluorine atoms at β-position. Compound **3** showed rat GluN2B binding affinity (Ki =4.0 nM) with no hERG (IC50 = 28 uM) liability. However this compound has very poor aqueous solubility, which was addressed through preparation of the water soluble phosphate pro-drug (compound **4**). Compound **4** was safe and well tolerated in rat and monkey toxicology studies.

EFFICIENCY REFINEMENT OF VERTICAL AXIS WIND TURBINE SYSTEM WITH THE APPLICATION OF MAGNETIC PROPELLING PHENOMENON

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ABSTRACT

Air may not seem like anything at all. But the wind is moving air and is caused by differences in the air pressure within our atmosphere; which is caused by the uneven heating of the earth surface by the sun and these variations on the earth's surface will causes the wind. The kinetic energy associated with the movement of atmospheric air is called as wind energy. Then the wind turbine is a system which transforms the kinetic energy available in the wind into mechanical energy. This paper mainly concentrates on "magnetic propelling phenomenon for efficiency improvement of vertical-axis wind turbine" so that this system will operates with the additional feature like repulsion characteristics of permanent magnets, Natural property of repulsion of magnetic poles are used as a energy banks. The force created as a result of this magnetic repulsion is also used while transforming the kinetic energy available in the wind into Mechanical energy, and this has the ability to operate in both high and low wind speed conditions due to its repulsive characteristics. Our choice for this model is to showcase its efficiency as compared to the traditional vertical axis wind turbine.

Keywords: Efficiency, Wind energy, Magnets, repulsion, Wind Turbine.

INFLUENCE OF THE NEW BRIGHTENER ON ELECTRODEPOSITION OF Zn-Ni ALLOY

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ABSTRACT

Electroplating of Zinc-Nickel alloy on mild steel substrate was obtained in presence of a new brightener on steel surface by electrodeposition technique. The effect of bath constituents, pH, current density and temperature on the nature of deposit was studied by Hull cell experiments. The bath composition and operating parameters were optimized by Hull cell experiments. Further investigations on the surface characteristics of deposit were carried out by using SEM and Reflectance studies. SEM analysis in presence of this brightener confirmed

the change in surface morphology and reflectance studies showed the formation of bright coating. Corrosion studies were done using Tafel polarization and Electrochemical Impedance technique.

Inclusion of brightener in the zinc-nickel alloy coating was confirmed by FTIR technique. The properties like brightness and corrosion resistance of Zinc-Nickel alloy deposit improved in presence of new brightener.

Keywords: Brightener, Electrodeposition, Zinc-Nickel, Impedance, Tafel polarization, Reflectance.

INVENTORIZATION OF WATER QUALITY OF ARKAVATHI RIVER –AN ANALYSIS

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ABSTRACT

Water is a basic need and a finite life supporting system. It is an important natural resource to touch all aspects of human civilization from agricultural and industrial development to the cultural and religious values embedded in society. (Koichiro Matsuura, 2008). The availability of water determines the natural composition and abundance of vegetation and once it is abstracted and used, it is considered as product and enters into economic sphere. The urban water bodies are strongly influenced by long term discharge of untreated domestic and industrial wastewaters, storm water runoff, chemical spills and solid waste dumping. All these have released different pollutants, which have a great ecological impact on the water quality in the affected watershed regions. In this case, a high degree of industrialization, urbanization, and other anthropogenic activities in Bangalore region has led to the contamination of various micro-watersheds including those within the Arkavathy Basin. With high population density, shortage of monsoon rainfalls, and increasing water depletion, fresh water bodies in the basin are now polluted and disappearing.The main causes of pollution of Arkavathy basin includes discharge of domestic sewage, illegal encroachment on wetlands, illegal quarrying and sand mining (mud-lifting) on the basin floor, deforestation of catchment zones, the use of huge quantities of detergents in the surrounding

household/apartments/garment washing industries, etc. Severely polluted, heavily turbid and colored water filled with heavy loads of dissolved and suspended matter, has rendered, Arkavathi river water, unsuitable for human consumption – either for drinking, irrigation, or animal drinking. Unsustainable fishing practices causing decline in fish diversity, as well exposing health risks to human consumers. Various fish species are now threatened in an increasingly polluted aquatic ecosystem of the Arkavathi basin.

Keywords: Natural resource, abundance, abstraction, chemical spill, watershed, unsustainable

TOTAL ECONOMIC VALUE OF SURFACE WATER BODIES - CASE STUDY

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ABSTRACT

The market does not value natural resources in the production process. Society, as a whole, traditionally, has not placed a monetary value on the benefits derived from these resources. When society has recognized these resources as having value, it has assigned a diffused, nonspecific value to them and has not translated that assigned value into market signals, i.e., financial incentives for preservation or disincentives for destruction of these land and water resources, embodied in the nation's legal and administrative system.The economic valuation of natural resources explains unpriced flows of public goods and services in the form of economics model. It also helps in tracking changes in ecosystems, such as degradation and its impact on human activities and well-being. The process extends the scope of information for analysis of impacts on the environment and ultimately on societies and gives Information on ecosystem services and the trade-offs/co-benefits involved.The economic valuation of water resource can be carried through Market-Based Approaches, Revealed Preference Method and Observable Market Interactions Methods. The services provided by water resource can be divided in to provisional services and regulatory services. Provisional Services of water are drinking. Bathing. Washing – Cloth, Utensils, Animal, Vehicle, irrigation. , recreations, fishing and collection of raw materials - soil, sand, gravel, clay, firewood, flowers and green forage for the cattle. These activities are considered as the direct socio-economic values. The Regulatory services of water resource are air quality regulation. water and air purification, micro climate regulation like temperature, moisture content etc, ground water recharge, soil erosion prevention, flood control, carbon and nitrogen sequestration. These activities are considered, as the indirect socio-economic values. **The total economic value of lakes after considering all the ecosystem services rendered by them is Rs 1977 Million**

Key Words: natural resource, benefits derived, natural capital, provisional services, regulatory services, total economic value, market based, revealed preference.

DEVELOPMENT OF NOVEL CORROSION NANO SCALE CORROSION INHIBITOR FOR SOFT CAST STEEL IN 1M HCL

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ABSTRACT

The inhibition capacity of nano olmesartan for corrosion of carbon steel in 1M HCl has been studied by using weight loss, potentiodynamic polarization and electrochemical impedance spectroscopic (EIS) techniquess at temperature of 303 K. The polarization results reveal that the olmesartan acts as a mixed type of corrosion inhibitor for carbon steel in 1M HCl. EIS study implies that Rp value of olmesartan increases with the increase of concentration. The inhibitory action of olmesartan was attributed due to the adsorption process and which obeys the Temkin's adsorption isotherm. The quantum chemical parameters were utilized to explain the electronic properties of olmesartan in order to confirm the relationship between the inhibition efficiency and molecular structure of the inhibitor. Surface morphology of low carbon steel with olmesartan was investigated by scanning electron microscopic (EIS) measurement.

Keywords: Corrosion; Inhibition, EIS

THERMOELECTRIC REFRIGERATION SYSTEM

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ABSTRACT

Refrigeration is a process in which work is done to move heat from one location to another. Refrigeration has many applications including but not limited to; household refrigerators, industrial freezers, cryogenics, air conditioning, and heat pumps. Cold is the absence of heat, hence in order to decrease a temperature, one "removes heat", rather than "adding cold." In order to satisfy the Second Law of Thermodynamics, some form of work must be performed to accomplish this. The work is traditionally done by mechanical work but can also be done by magnetism, laser or other means.