

SRINIVAS UNIVERSITY

Private University Established by Karnataka
Govt. ACT No.42 of 2013

Srinivas Nagar, Mukka- 574 146, Surathkal, Mangaluru.

Phone: 0824-2477456

Web: www.srinivasuniversity.edu.in

Email: info@srinivasuniversity.edu.in



INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY (ICON-2022)

on

11th & 12th November 2022

Abstract Book



Organised by

Institute of Engineering & Technology

&

Research & Innovation Council

SRINIVAS UNIVERSITY

Private University Established by Karnataka, Govt. ACT No.42 of 2013
Web: www.srinivasuniversity.edu.in; Email: info@srinivasuniversity.edu.in

Chief Patrons



Dr. CA A. Raghavendra Rao
Chancellor



Dr. A. Srinivas Rao
Pro Chancellor

Patrons



Dr. P. S. Aithal
Vice Chancellor



Dr. Anil Kumar
Registrar



**Dr. Shrinivasa
Mayya D.**
Registrar
(Evaluation)



Dr. Ajay Kumar
Registrar
(Development)



**Mr. Adithya
Kumar Maiya**
Registrar
(Acad. & Devlp.)



Dr. Thomas Pinto
Dean



Dr. Praveen B. M.
Director - Research & Innovation Council



Two days
INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY
(ICON-2022)

Dr. CA A. Raghavendra Rao

(Honourable Chancellor, Srinivas University)

Will be the president of the function

Mr. Ravi Kumar IAS

(Deputy Commissioner, Dakshina Kannada, Karnataka, India)

Will be the Chief Guest

Dr. Sabu Thomas

(Honourable Vice-Chancellor, Mahatma Gandhi University, Kerala)

Key note speaker

Dr. Arun M. Isloor

(Professor of Chemistry, National Institute of Technology Karnataka, Surathkal)

Key note speaker

“GUEST OF HONOURS”

Dr. Punith Kumar M. K.

(R&D Engineer, IMEC, Belgium)

Dr. A. Srinivas Rao

(Honourable Pro - Chancellor, Srinivas University)

Smt. A. Vijayalakshmi R. Rao

(Member, Board of Governors, Srinivas University)

Prof. Er. Smt. A. Mitra S. Rao

(Member, Board of Governors, Srinivas University)

Dr. P. S. Aithal

Conference Chairperson

(Honourable Vice – Chancellor, Srinivas University)



SRINIVAS UNIVERSITY

VISION & 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

Key Note Speakers



Dr. Sabu Thomas

Prof. Dr. Sabu Thomas (born 14 March 1962) is an Indian professor who is serving as the vice-chancellor of Mahatma Gandhi University, Kerala. He is also a full professor (25 March 1998 onwards) of Polymer Science and Engineering at the School of Chemical Sciences. He was the Pro-Vice Chancellor of Mahatma Gandhi University, Kerala during the period of 31 August 2017 to 31 August 2018, Director of School of Chemical Science during the period of 1 November 2010 to 31 December 2013. Hon. Director of International & Inter-University Centre for Nanoscience and Nanotechnology during the period of 28 March 2009 to 11 September 2015, 2 February 2016 to 11 October 2017. In 2015, he received his first Doctor Honoris Causa from University of Southern Brittany in Lorient, France. In 2016, he received his second Doctorate honoris causa from University of Lorraine, France. He was awarded the Fellow of the Royal Society of Chemistry, London, FRSC in 2012. He received the Bronze Medal of the Chemical Research Society of India and the MRSI Medal of the Material Research Society of India in 2013. He was the recipient of Fulbright-Nehru International Education Administrators Award 2017. He received TRiLA Academician of the year 2018 award. He was ranked 114th in World's Top Scientists by a Stanford University study. The same list ranked him 2nd in top Indian polymer scientists



Dr. Arun M. Isloor

Dr. Arun M. Isloor completed PhD at Mangalore university and a post-doc from Israel, presently working as a Professor in the department of chemistry, NITK, Surathkal. His notable achievements are as follows:

- Best Reviewer award from 'European Journal of Medicinal Chemistry, (For the year 2013).
- Best Reviewer award from 'Desalination' (for the year 2012).
- Best Research paper award from Vision group on Science Technology, Government of Karnataka (during 2012).
- BRNS Young Scientist award (during 2009).
- Published more than 100 research papers in Acta Crystallographic (Section e) International journal.
- Received prestigious 'Technion' Postdoctoral fellowship from Technion Israel Institute of Technology (during 2005-2007)
- Management Secretary of NITK English medium school, 2013 to till date
- Served as one of 'Active warden' of NITK hostels (2008 till 2014).
- Faculty advisor of ISTE student's chapter at NITK (2009 till 2011).
- Faculty advisor of 'Management forum' of NITK (2012 till date).

Invited Speaker

Engineering of Nanomaterials for Electrochemical Water splitting



D. H. Nagaraju

Department of Chemistry, REVA University, Bangalore 560064, India

Abstract – Increasing demand for ecofriendly energy is an urgent requirement to solve biggest global threats like climate change and global warming. To solve this serious threat facing by human kind electrochemical water splitting is a novel approach to get 99.99% clean and green hydrogen, oxygen, which is sustainable and easy to carry out. 4d-block transition elements like Mo, Ru, Rh, Pd were also shows excellent catalytic activities due their structure and doping. On the other hand, 3d-ransition elements particularly which are relatively cheap like Ni, Co, Fe, Cu also displays good catalytic activity. Engineering of these transition metals with chalcogenides, hydroxides and phosphides with selective doping with each other are having the potential to replace the ideal and costly metal like Pt. In these material combinational trails Iron effect plays an important role when it is mixed hydroxides and chalcogenides of Ni and Co with quite high stability and better activity. The different phases of MoS_2 , MoSe_2 and MoTe_2 were also the potential competitors in providing good activity. In designing the material composition for water splitting, it important to know and analyze the important parameters and their valuable input in understanding the requirements for better activity has been discussed in this work. The aim herein is to provide insights gathered in the process of studying, and describe valuable guidelines for engineering other kinds of nanomaterial catalysts for energy conversion technologies.

Invited Speaker

Impact of surface modification on membrane performance



Dr. Mahesh S. Padaki

Centre for Nano and Material Sciences, Jain University, Jain Global Campus,
Bangalore-562112, India

Abstract – Membrane surface properties have a significant impact on membrane performance because the membrane surface is in direct contact with the feed. Chemical modification of membrane surfaces is an appealing method for imparting desirable surface properties while retaining desirable bulk polymer properties such as mechanical and chemical resistance, as well as membrane morphology. Membrane fouling or adsorption of undesirable species onto the membrane surface affects membrane properties and results in poor performance. As a result, much effort has gone into minimizing the unwanted accumulation of molecules on the membrane surface. My talk focuses on membrane surface modification for membrane properties enhancement and fouling suppression. Recent advancements in the field of chemical modification will be highlighted, as well as challenges and future directions. Recent research has focused on the development of controlled polymerization methods that allow for better control of the three-dimensional structure of the grafted nanolayer.

Invited Speaker

Reusable Nano-catalyzed Efficient Synthesis of Organoboronate Esters



Dr. Shubhankar Kumar Bose

Centre for Nano and Material Sciences (CNMS), JAIN (Deemed-to-be University),
Jain Global Campus, Bangalore-562112, India.

Abstract – Organoboronates are important in medicinal chemistry in and of themselves, as well as being often used as synthetic intermediates for transition-metal catalyzed cross-coupling, conjugate addition and many other reactions. The transition-metal-catalysed borylation is considered as one of the most efficient methods for the synthesis of organoboron derivatives. Taking into consideration of chemical and pharmaceutical process, the major drawbacks of homogeneous catalysis are metal contamination into products and inability to recover the catalyst for reuse, limit its application in industrial interest, biomolecules, and materials science. The use of nanoparticles as heterogeneous catalysts is a current topic of research to overcome these limitations. We have developed a series of easy-to-prepare, air-stable and recyclable nano catalyst systems for alkyl and aryl halides borylation, and carbonyl, alkenes and alkynes hydroboration. Prominent advantages of these methods include the avoidance of any ligand, a wide substrate scope and high yield. Reaction shows excellent recyclability. The key results will be described.

International Conference on Nanotechnology (ICON-2022)

Programme Schedule

Day-1 Friday (11/11/2022)

Session	Time	Programme
Registration + Breakfast	09:00 am 10:00 am	Registration + Breakfast
Pre-Conference brief	10:00 am 10:30 am	Dr. Vasudeva Bhat (Research Professor, SUIET, Mukka, Mangaluru) Topic: Challenges and opportunities in Nanotechnology
Inaugural Session	10:30 am - 12:00 Noon	Dignitaries Dr. CA A. Raghavendra Rao (Honourable Chancellor, Srinivas University) Will be the president of the function Mr. Ravi Kumar IAS (Deputy Commissioner, Dakshina Kannada, Karnataka, India) Will be the Chief Guest Dr. Sabu Thomas (Honourable Vice-Chancellor, Mahatma Gandhi University, Kerala) Key note speaker Dr. Arun M. Isloor (Professor of Chemistry, National Institute of Technology Karnataka, Surathkal) Key note speaker “GUEST OF HONOURS” Dr. Punith Kumar M. K. (R&D Engineer, IMEC, Belgium) Dr. A. Srinivas Rao (Honourable Pro - Chancellor, Srinivas University) Smt. A. Vijayalakshmi R. Rao (Member, Board of Governors, Srinivas University) Prof. Er. Smt. A. Mitra S. Rao (Member, Board of Governors, Srinivas University) Dr. P. S. Aithal Conference Chairperson (Honourable Vice – Chancellor, Srinivas University) Dr. Thomas Pinto Dean, Srinivas University, SUCET Dr. Praveen B.M. Conference Convenor
	12:00 12:15 pm	Tea Break

Key Note	12:15 pm 01:00 pm	Key Note Speaker Dr. Sabu Thomas Honourable Vice-Chancellor, Mahatma Gandhi University, Kerala Topic: Circular Economy: New Opportunities in Sustainable Nano Materials and Polymer Bio-Nanocomposites
Key Note	01:00 pm 01:30 pm	Key Note Speaker Dr. Arun M. Isloor Professor of Chemistry, National Institute of Technology Karnataka, Surathkal Topic: Synthesis of novel zwitterionic polymer nanoparticles for allied applications
	01.30 pm 02.30 pm	Lunch Break
Invited Talk	02.30 pm 03.00 pm	Invited Talk D. H. Nagaraju Professor, Department of Chemistry, REVA University, Bangalore Topic: Engineering of Nanomaterials for Electrochemical Water splitting
Oral Presentation	03.00 pm 05.00 pm	Oral Presentation (OP-1 to OP-10)
Poster Presentation	04.00 pm 05.00 pm	Poster Presentation (PP-1 to PP-40)

Day-2 Saturday (12/11/2022)

Session	Time	Programme
Breakfast	9:00 am 9:30 am	Breakfast
Invited Talk	09:30 am 10:00 am	Invited Talk Dr. Mahesh Padki Professor, Centre for Nano and Material Sciences, Jain University Topic: Impact of surface modification on membrane performance
Invited Talk	10:00 am 10:30 am	Invited Talk Shubhankar Kumar Bose Professor Centre for Nano and Material Sciences (CNMS), JAIN University, Bengaluru Topic: Reusable Nano-catalyzed Efficient Synthesis of Organoboronate Esters
	10:30 am 10:45 am	Tea Break
Oral Presentation	10:45 am 12:30 pm	Oral Presentation (OP-11 to OP-20)
	12.30 pm 01.00 pm	Valedictory Programme
	01.00 pm	Lunch Break

		Oral Presentation 3:00 pm - 5:00 pm (IST)	
OP. order	Paper ID	Name	Title
OP-1	ID-2	Dr. M. Sivabharathy	An investigation of the structural, optical, magnetic, and superconducting behavior of LBCO/MWCNT nanocomposites.
OP-2	ID-16	Dr. Lenin N.	Role of gadolinium doped in Nickel Nanoferrites on Structural, Optical, Electrical, and Magnetic Properties.
OP-3	ID-67	Dr. Shrikant H. Nimkar	Measuring sensitivity of conducting nano-composites of polyaniline / tin dioxide thin films for carbon dioxide gas sensor.
OP-4	ID-1	Dr. Prasanna Subhash Joshi	Impact of Green Synthesized Zinc Oxide Nanoparticles as Feed Additives on Growth and Flesh Quality of Freshwater Fish Channa punctatus (Bloch, 1793)
OP-5	ID-68	Ms. Geeta D. Pai	Anticorrosive property of a green and sustainable inhibitor from leaves extract of Tabebuia heterophylla plant: Chemical, Electrochemical and Surface Analysis approach.
OP-6	ID-47	Mrs. Varsha Gangadhar Bangera	Nanorings-The non-volatile RAM
OP-7	ID-12	Mr. Anivarthi Upadhyaya	Green synthesis of ultrafine mesoporous metal oxide nanoparticles using plant extract
OP-8	ID-63	Mr. Anvar Shathik J.	Bidimensional Empirical Mode Decomposition based Dimensionality reduction for Object Detection Using Alexnet Architecture
OP-9	ID-39	Ms. Shashirekha K.	Newly synthesised Schiff's base derivative on mild steel in acid medium
OP-10	ID-43	Dr. Canute Sherwin	A Brief Review on the Role of Nanostructured Electrodes in Production of Green Hydrogen

		Oral Presentation 10:45 am - 12:30 pm (IST)	
OP. order	Paper ID	Name	Title
OP-11	ID-51	Mr. Varadaraj S.	Exploration of the properties of electrodeposited Nickel-Graphene coating on Mild steel.
OP-12	ID-70	Dr. Nookala Venu	Fuzzy based high performance machine learning approach for the selection of bio-resource.
OP-13	ID-11	Dr. Nutanvarsha P. Deshmukh	Review on Present Status and Future Potential of Renewable Energy in India
OP-14	ID-64	Mr. Raghavendra B. M.	Characterization and Mechanical Studies of Reduced Graphene Oxide Filled E-Glass Reinforced with Epoxy Nano Composites.
OP-15	ID-71	Mrs. Pavana Krishnamurthy	Hand Grip Strength and Muscle Endurance Time in Vegetarian and Non-Vegetarian Adolescents' A Comparison
OP-16	ID-44	Mr. Abhinav	The Effect of Radiation upon the Environment

OP-17	ID-62	Mrs. Shubha	Two new methods for the synthesis of low-resistance carbon with possible potential applications in supercapacitors: Flash pyrolysis in a domestic microwave oven and fast pyrolysis in a muffle furnace in lab generated inert atmospheres using dried green leaves from banana plants as raw materials
OP-18	-	Dr. Ravi D.	Bio-mapping of pollution load in Arkavathi river
OP-19	-	Mr. K. Raju	Waste management in ground water
OP-20	ID-69	Dr. Asha Saraswathi	Some Realizable and nonrealizable Lattice of Trail Sets of a Connected Graph

Note: Time duration for oral presentation is 5 + 1 min

ID-1: Impact of Green Synthesized Zinc Oxide Nanoparticles as Feed Additives on Growth and Flesh Quality of Freshwater Fish *Channa punctatus* (Bloch, 1793)

P.S. Joshi¹, S. G. Chhaba², B. M. Praveen³ and P. S. Aithal⁴

¹Department of Zoology, Shri Shivaji Arts, Commerce and Science College, Maharashtra, India

²Department of Zoology, Smt. Radhabai Sarda Arts, Commerce and Science College, Maharashtra

³Department of Chemistry, Institute of Engineering & Technology Srinivas University, Mangalore

⁴Institute of Management and Commerce, Srinivas University, Mangalore – 575 001, INDIA

Abstract – Zinc deficiency in aquatic animals affects the biological processes and physiological functions. Thus, the supplement of Zinc Oxide Nanoparticles can be used as method to overcome zinc deficiency. Nanoparticles have the potential to enhance the growth and health of the fish. The aim of this study is to evaluate the efficacy Zinc Oxide Nanoparticles supplemented diet as growth promoter and flesh quality enhancer. The green synthesized Zinc Oxide Nanoparticles were characterized by X-ray diffraction (XRD) and scanning electron microscopy (SEM). Different concentrations Zinc Oxide Nanoparticles (2, 4, 6, 8 and 10mg/kg) were administered in the basal diet of freshwater fish *Channa punctatus* for 60 days to observe the growth and flesh quality of fish. The growth performance of fish showed significantly increased total length, total weight, specific growth rate, body weight index, relative growth rate increases and health condition factor with increased in dietary Zinc Oxide Nanoparticles level. The decreased feed conversion ratio and increased feed efficiency ratio improved, improved average feed intake and survival rate was observed in groups fed with high level of dietary Zinc Oxide Nanoparticles. The carcasses composition analysis showed that moisture, crude lipid and ash content do not represent any significant change except the crude protein level was observed to be improved with increased Zinc Oxide Nanoparticles content in diet. These results suggest that the nanotechnology could apply for feed formulation technology and pave the way for the dietary supplementation of zinc oxide nanoparticles as safe ingredients for aquatic animals to overcome the zinc deficiency.

Keywords: *Channa punctatus*, feed additives, flesh quality, freshwater fish, green synthesized, growth performance, zinc oxide nanoparticles.

ID-2: An investigation of the structural, optical, magnetic, and superconducting behaviour of LBCO/MWCNT nanocomposites

R. Ramesh Kannan¹ and M. Sivabharathy¹

¹Department of Physics, Sethu Institute of Technology, Kariapatti-626115, Tamilnadu, India

Abstract - The outcomes of rare earth elements doped with multiwall carbon nanotubes (MWCNT) for super conductor applications, such as cryotron, memory devices, SQUID, etc., are shown here. The $\text{La}_{2-x}\text{Ba}_x\text{CuO}_4/\text{MWCNT}$ nanocomposites were created by hydrothermal synthesis ($x = 0.0, 1.0, \text{ and } 2.0$). According to X-ray diffraction (XRD) analysis, the LBCO phase's orthorhombic structure and the MWCNT's hexagonal structure were both obtained. The TEM and FESEM findings showed that the MWCNT's exterior was consistently shielded by a nanoscale cuprate material and that the distinctive configuration of the pristine MWCNT was maintained throughout the doping process. A narrowing of the band gap may be seen in the nanocomposites & UV/VIS spectra. R-T measurements show that the resistivity entirely disappears for the LCO/MWCNT and LBCO/MWCNT nanocomposites at 28.8 K and 50.6 K. V-I analysis was used to determine the maximum current densities of 2.2 and 3.2 MA/m² for the LCO/MWCNT and LBCO/MWCNT nanocomposites at 15 K. The existence of diamagnetism in superconductors is confirmed by the uniaxial anisotropy enhancement brought about by a lower SQR value and the Y-K angle extrapolates maximum of 128.68° and 89.99° for the LCO/MWCNT and LBCO/MWCNT nanocomposites, respectively.

Keywords: MWCNT, Nanocomposites, Magnetic property, Current density, Superconductivity.

ID-3: Effect of dietary selenium nano-particles on growth performance and antioxidant capacity in *Clarias batrachus* (Linnaeus, 1758)

S. G. Rodge ¹, P.S. Joshi ¹, V. G. Thakare ²

¹Department of Zoology, Shri Shivaji Arts, Commerce and Science College, Akot, Maharashtra, India

²Department of Zoology, Government Vidarbha Institute of Science and Humanities, Amravati, Maharashtra, India

Abstract - A three-month nutritional study was carried out to examine the effects of dietary selenium nanoparticles (Se-N) on performance in *Clarias batrachus* (Linnaeus, 1758). Selenium nanoparticles (Se-N) were synthesized by the chemical reduction of sodium selenite by glutathione (reduced form) and stabilized by bovine serum albumin (BSA). A basal diet was supplemented with Se-N at five levels, including 0 (control), 0.2, 0.4, 0.8, and 1.2 mg/kg. About 50 specimens were distributed randomly into 5 aquarium containing 100-L freshwater (10 fishes/tank). Each dietary treatment was offered to specimens in all five tanks. Specimens were handfed three times daily to the satiation. Water temperature and salinity were 30 ± 0.4 °C and 40 g/L, respectively. The fishes fed with Se-N supplemented diets had positive trends in growth performance and feed conversion ratio. The reduced lipid peroxidation and increased superoxide dismutase, catalase and glutathione peroxidase activities were also observed in experimental fishes fed Se-N supplemented diets. The obtained results recommended the Se-N supplemented in diet for successful aquaculture of this important freshwater fish *Clarias batrachus* (Linnaeus, 1758).

Keywords: Antioxidant capacity, *Clarias batrachus*, Diet, feeding, growth performance, selenium nano-particles.

ID-4: A review on innovations in nanotechnology for water treatment

Rajesh S. Mankar¹

¹Department of Zoology, Shri Shivaji Arts, Commerce and Science College, Akot, Maharashtra, India

Abstract - The present article is a systematic review on the Innovations in nanotechnology for water treatment. The nanoparticles are designed to attract water and are highly porous, soaking up water like a sponge while repelling dissolved salts and other impurities. The hydrophilic nanoparticles embedded in the membrane also repel organic compounds and bacteria, which tend to clog up conventional membranes over time. There are many water purifiers available in the market which use different techniques like boiling, filtration, distillation, chlorination, sedimentation and oxidation. Currently nanotechnology plays a vital role in water purification techniques. Nanotechnology is the process of manipulating atoms on a nanoscale. In nanotechnology, nano membranes are used with the purpose of softening the water and removal of contaminants such as physical, biological and chemical contaminants. There are variety of techniques in nanotechnology which uses nano particles for providing safe drinking water with a high level of effectiveness. Some techniques have become commercialized. For better water purification or treatment processes nanotechnology is preferred. Many different types of nanomaterials or nanoparticles are used in water treatment processes. Nanotechnology is useful in regards to remediation, desalination, filtration, purification and water treatment. The main features that make nanoparticles effective for water treatment are- More surface area; Small volume; the higher the surface area and volume, the particles become stronger, more stable and durable; Materials may change electrical, optical, physical, chemical, or biological properties at the nano level and it makes chemical and biological reactions easier.

Keywords: Nano-adsorbents, nanomembranes, nanometals, nanotechnology, photocatalysis, water treatment.

ID-5: A systematic review on potential application of Nanotechnology in Controlling the Plant Pathogenic Fungi

Sumitkumar L. Mirge¹

¹Department of Botany, Shri Shivaji Arts, Commerce and Science College, Akot, Maharashtra, India

Abstract - Agriculture plays a vital role by providing nourishment and serving as a source of income for many countries. It is the major source of livelihood for people in rural areas as they depend on agricultural cultivation. The majority of crops losses occur as a result of animal pests, while weeds, microbial diseases and fungal pathogens. The present strategies for plant disease control depend transcendently on agrochemicals that cause negative effects on the environment and humans. Nanotechnology can help by reducing the negative impact of the fungicides, such as enhancing the solubility of low water-soluble fungicides, increasing the shelf-life, and reducing toxicity, in a sustainable and eco-friendly manner. The present review possibly described the properties and synthesis of nanoparticles, their utilization for plant pathogenic fungal disease control, nano-formulations of agro-nanofungicides.

Keywords: Biotechnology, fungi, Nanomaterials, Nanotechnology, Plants, pathogen.

ID-6: A review role on nanotechnology in fish disease control

Snehal S. Butle¹

¹Department of Zoology, S. S. S. K. R. Innani Mahavidyalaya, Karanja (Lad), Maharashtra, India

Abstract: The present review reveals an idea about probable application of nanotechnology in aquaculture as a potential novel tool which may possibly enhance the management and the control of disease prevalence. In recent decades, aquaculture has played a significant role in fulfilling the vast demand for animal protein requirements and consequently in food security. However, environmental contamination and disease prevalence are considered essential challenges for the sector. In this regard, new approaches have been paved in technology to deal effectively with such challenges. Among these, nanotechnology is an innovative tool having a broad spectrum of uses and a tremendous potential in aquaculture practices. It can provide new technologies for management of drugs and vaccines therefore hold the assurance for protection of farmed fish against disease causing pathogens. Therefore, the importance of this technology to promote sustainable aquaculture has also been highlighted. Focusing on the role of selenium nanoparticles as an efficient element is discussed also in this article.

Keywords: Aquaculture, biotechnology, diseases, drugs, fish productions, nanotechnology.

ID-7: A systematic review on utility of Nanomaterials in plant tissue culture

Ashwini B. Phokmare¹

¹Department of Botany, Shri Shivaji Arts, Commerce and Science College, Akot, Maharashtra, India

Abstract: The present review aims to consolidate all of the current achievements made through the utilization of nanotechnology into plant tissue culture and highlight the positive attributes of using nanoparticles in plant tissue culture. Plant tissue culture is an essential of plant biology. It is necessary for conservation, propagation, genetic manipulation, bioactive compound production and plant improvement. In recent years, the application of nanoparticles has successfully led to the elimination of microbial contaminants from explants and demonstrated the positive role of nanoparticles in callus induction, organogenesis, somatic embryogenesis, soma-clonal variation, genetic transformation and secondary metabolite production. From the review, it is cleared that plant nanobiotechnology is emerging as a prominent and promising field with excellent potential towards plant improvement. In future, more targeted research is required to clarify and streamlined the process to harness only the beneficial aspects without exposure to the adverse effects.

Keywords: Biotechnology, Nanomaterials, Nanotechnology, Plants, Tissue culture.

ID-8: A microwave assisted one pot green synthesis of 2, 4, 5-trisubstituted imidazole derivatives using nickel ferrite as an efficient catalyst

Chandrashekhar A. Ladole^{1*}

¹Shri Shivaji Arts, Commerce & Science College, Akot, Maharashtra state - 444101

Abstract: A convenient and efficient environmentally benign protocol for the synthesis of 2,4,5 trisubstituted Imidazole Derivatives in moderate to high yields via one-pot three component reaction of aldehyde (1 mmol), benzyl (1mmol), ammonium acetate (2 mmol) and Nickel ferrite were placed in 50 mL in RBF and place in microwave for required time. Reaction was monitored by using TLC. This protocol offers several advantages of its greenness with respect to mild reaction conditions, good performance, operational simplicity and short time reaction and easy work-up procedure. After completion of reaction, mixture was diluted with chloroform (12 mL) and reaction mass was stirred. The slurry was filtered to remove the catalyst and washed with chloroform (4×5mL). Combined filtrate was evaporating on rotary-evaporator to obtain a solid residue. The solid residue was stirred in water than filtered and recrystallized from ethanol to give pure product. The synthesized products were confirmed using FT-IR, ¹H & ¹³C NMR spectroscopic data and melting points compared with reported values.

Keywords: 2, 4, 5-trisubstituted imidazole, Nickel Ferrite, Multicomponent reaction, Microwave assisted synthesis

ID-9: Potential risk to pollinators from nanotechnology-based pesticides

M. S. Mahalkar¹ and M. M. Dhore¹

¹Department of Botany, Shri Shivaji Arts, Commerce and Science College, Akot, Maharashtra, India

Abstract: The decline in populations of insect pollinators is a global concern. While multiple factors are implicated, there is uncertainty surrounding the contribution of certain groups of pesticides to losses in wild and managed bees. Nanotechnology-based pesticides (NBPs) are formulations based on multiple particle sizes and types. By packaging active ingredients in engineered particles, NBPs offer many benefits and novel functions, but may also exhibit different properties in the environment when compared with older pesticide formulations. These new properties raise questions about the environmental disposition and fate of NBPs and their exposure to pollinators. Pollinators such as honey bees have evolved structural adaptations to collect pollen, but also inadvertently gather other types of environmental particles which may accumulate in hive materials. Knowledge of the interaction between pollinators, NBPs, and other types of particles is needed to better understand their exposure to pesticides, and essential for characterizing risk from diverse environmental contaminants. The present review discusses the properties, benefits and types of nanotechnology-based pesticides, the propensity of bees to collect such particles and potential impacts on bee pollinators.

Keywords: Environment, Nanotechnology, Pesticides, Pollinators, Risk.

ID-10: Controlled green synthesis of silver nanoparticles and exploring physicochemical properties

P. A. Gotmare^{1*}, G. B. Ingle G.B. ¹, and S. V. Kolhe¹

¹Department of chemistry, Shri Shivaji Arts Commerce and Science College Akot-444101, Maharashtra (India)

Abstract: The evolution of nanotechnology and the production of nanomedicine from various sources had proven to be of intense value in the field of biomedicine. The smaller size of nanoparticles is gaining importance in research for the treatment of various diseases. Moreover, the production of nanoparticles is eco-friendly and cost effective. In the present study, the green synthesis of silver nanoparticle was carried out by using papaya leaf extract and silver salt. The results of the reduction reaction of nano ions were confirmed by using UV-vis spectrophotometer. The synthesized silver nanoparticles were characterized using FTIR spectroscopy and SEM analysis. The physicochemical parameters like pH, Refractive Index, etc. were also studied. In summary the synthesized silver nanoparticles showed acceptable size and shape of nanoparticles and effective physicochemical properties.

Keywords: Controlled, green synthesis, nanoparticle, physicochemical, silver.

ID-11: Review on Present Status and Future Potential of Renewable Energy in India

Nutanvarsha P. Deshmukh¹

¹Department of Botany, Shri Shivaji Arts, Commerce and Science College, Akot, Maharashtra, India

Abstract: The Sun has been worshiped as a life-giver to our planet since ancient times. The industrial ages gave us the understanding of sunlight as an energy source. India is endowed with vast solar energy potential. About 5,000 trillion kWh per year energy is incident over India's land area with most parts receiving 4-7 kWh per sq. m per day. Solar photovoltaics power can effectively be harnessed providing huge scalability in India. The primary objective for deploying renewable energy in India is to advance economic development, improve energy security, improve access to energy, and mitigate climate change. Sustainable development is possible by use of sustainable energy and by ensuring access to affordable, reliable, sustainable, and modern energy for citizens. Strong government support and the increasingly opportune economic situation have pushed India to be one of the top leaders in the world's most attractive renewable energy markets. Presently, most of India's energy demands are fulfilled by fossil fuels like coal, petroleum, natural gas, etc. Due to such high demand for fossil fuels, these fossil fuels will soon get depleted. India is increasingly adopting responsible renewable energy techniques and taking positive steps towards carbon emissions, cleaning the air and ensuring a more sustainable future. Recently, India achieved 5th global position in solar power deployment by surpassing Italy. Solar power capacity has increased by more than 11 times in the last five years from 2.6 GW in March, 2014 to 30 GW in July, 2019. Presently, solar tariff in India is very competitive and has achieved grid parity.

Keywords: Renewable energy, Solar energy, Energy source

ID-12: Green synthesis of ultrafine mesoporous metal oxide nanoparticles using plant extract

Anivarthi¹, Vinola Zeena Rodrigues¹

¹Department of Chemistry St. Aloysius college, Mangaluru Karnataka 575003

Abstract: Multifunctional Titanium dioxide nanoparticles (TiO₂ Nps) were synthesized by solution combustion synthesis using Tabernaemontana divaricate (td) and Cascabela thevetia (CT) leaf extract. that has definite role in directing the particle size of Titanium dioxide nanoparticles (TiO₂ NPs) during the reduction process. The TiO₂ NPs are well characterized by the various analytical and microscopic tools. FT-IR spectra confirms the Ti–O bond formation. The p-XRD patterns reveals the formation of Titanium dioxide nanoparticles with average particle size of 11.95–16.64 nm. The porous morphology of the nanostructures and the elemental composition purity are evident from the micrographs obtained from Field Emission Scanning Electron Microscopy (FESEM) coupled with Energy Dispersive Spectroscopy (EDS). UV–Vis spectroscopic analysis was carried out and band gap via Tauc-plot relation and was found in the range of 3.47–3.96 eV. A large surface to volume ratio and the pore volume of TiO₂ NPs was observed by Brunauer–Emmett–Teller (BET) and Barrett–Joyner–Halenda (BJH) analysis.

Keywords: Titanium dioxide, nanoparticles, Tabernaemontana divaricate,

ID-13: A review on recent advances in NanochemistryIngle G.B.^{1*}, Gotmare P.A.¹, Kolhe S.V.¹¹Department of Chemistry, Shri Shivaji Art's, Commerce and Science College, Akot - 444101, (Maharashtra), India

Abstract: Nanochemistry is the combination of chemistry and nano science. Nanochemistry is associated with synthesis of building blocks which are dependent on size, surface, shape and defect properties. Nanochemistry is being used in chemical materials and physical science as well as engineering, biological and medical applications. Nanochemistry and other nanoscience fields have the same core concepts but the usages of those concepts are different. Nanochemistry can be characterized by concepts of size, shape, self-assembly, defects and bio-nano; so, the synthesis of any new nano-construct is associated with all these concepts. Nano-construct synthesis is dependent on how the surface, size and shape will lead to self- assembly of the building blocks into the functional structures; they probably have functional defects and might be useful for electronic, photonic, medical or bioanalytical problems.

Silica, gold, polydimethyl siloxane, cadmium selenide, iron oxide and carbon are materials that show the transformative power of nanochemistry. Nanochemistry can make the most effective contrast agent of MRI out of iron oxide (rust) which has the ability of detecting cancers and even killing them at their initial stages. Silica (glass) can be used to bend or stop light in its tracks. Developing countries also use silicone to make the circuits for the fluids to attain developed world & pathogen detection abilities. Carbon has been used in different shapes and forms and it will become a better choice for electronic materials. Overall, nanochemistry is not related to the atomic structure of compounds. Rather, it is about different ways to transform materials into solutions to solve problems. Chemistry mainly deals with degrees of freedom of atoms in the periodic table however nanochemistry brought other degrees of freedom that controls material & behaviors.

Nanochemical methods can be used to create carbon nanomaterials such as carbon nanotubes (CNT), graphene and fullerenes which have gained attention in recent years due to their remarkable mechanical and electrical properties.

Keywords: Atom, Bioanalytical Chemistry, Nanochemistry, Molecule etc.

ID-14: Engineered nanomaterials for aviation industry in covid-19 context: a time-sensitive review

Engineered nanomaterials (ENMs) are catalyzing the industry 4.0 euphoria in a significant way. One prime beneficiary of ENMs is the transportation industry (automotive, aerospace, rail car), where nanostructured multi-materials have ushered the path toward high-strength, ultra-impact resistant, lightweight, and functionally graded engineered surfaces/components creation. The present paper aims to extrapolate much-needed ENMs knowledge from literature and its usage in the aviation industry, highlighting ENMs contribution to aviation state-of-the-art. Topics such as ENMs classification, manufacturing/synthesis methods, properties, and characteristics derived from their utilization and uniqueness are addressed. The discussion will lead to novel materials' evolving need to protect aerospace surfaces from unfolding SARS-COVID-19 and other airborne pathogens of a lifetime challenge.

Keywords: Engineered Nanomaterials, airborne pathogens, nanostructured

ID-15: Application of NMI-TfCl-mediated amide bond formation in the synthesis of biologically relevant oxadiazole derivatives employing less basic (hetero)aryl amines

¹M A Rajendra & ¹K Sunil

¹Department of Chemistry, Sri Siddhartha Institute of Technology, SSAHE, Tumkur

Abstract: A series of oxadiazole analogues have been reported to display a wide range of biological activities. In this paper, we report the synthesis of a series of novel analogues based on oxadiazole core and explore its potential as novel anti-bacterial agents. The synthesized compounds were analyzed using spectroscopic techniques such as ¹H NMR, LC-MS, and FTIR. Modification of methodology for the synthesis of some oxadiazoles linked to amides under mild conditions. The developed protocol using NMI-TfCl has been found to be effective and tolerant for the amide bond formation reaction of a series of electronically deactivating and sterically challenging amines. The antioxidant potential of the newly synthesized compounds has been evaluated at the later stage.

Keywords: Oxadiazole, NMI-TfCl,

ID-16: Role of gadolinium doped in Nickel Nanoferrites on Structural, Optical, Electrical, and Magnetic Properties

N. Lenin^{1*}, M. Prabhu¹, M. Sivabharathy¹, S.A. Sethu Raman², A. Senthil Kumar²

¹Department of Physics, Sethu Institute of Technology, Kariapatti – 626 115, Tamil Nadu, India

²Department of Mechanical Engineering, Sethu Institute of Technology, Kariapatti – 626 115, Tamil Nadu, India

Abstract: The sonochemical reaction approach was used to make $\text{NiGd}_x\text{Fe}_{2-x}\text{O}_4$ nano ferrites ($x=0.01, 0.03, 0.05, 0.07, \text{ and } 0.09$). X-ray diffraction (XRD), ultra violet-diffuse reflectance spectroscopy, scanning electron microscopy, energy dispersive X-ray spectroscopy, vibrating sample magnetometer, and electrochemical impedance spectroscopy were used to investigate the optical, magnetic, electrical, and structural properties of $\text{NiGd}_x\text{Fe}_{2-x}\text{O}_4$ nano ferrites. The creation of a cubic spinel structure was confirmed by analyzing the XRD pattern of these $\text{NiGd}_x\text{Fe}_{2-x}\text{O}_4$ nano ferrites. To investigate the dielectric behavior of the produced nano ferrites, an impedance study was performed. The addition of Gd to $\text{NiFe}_{2-x}\text{O}_4$ nanoparticles increased the dielectric characteristics of the produced nano ferrites, according to characterization experiments. A cation distribution has been proposed for the determination of various important theoretical parameters for these samples. The addition of Gd $3+$ nanoparticles has shown the ferromagnetic behavior at room temperature confirmed by VSM analysis. A specific correlation between magnetic interaction and lattice strain was observed in Gd $3+$ substituted nickel ferrite. An increase in Gd concentration in the manufactured nano ferrites resulted in a rise in saturation magnetization and a decrease in coercivity.

Keywords: Nanoferrites, Sonochemical, X-ray diffraction, Magnetic materials, Dielectric properties, Hysteresis loops

ID-17: Applications of Nanotechnology in Smart Building Construction

Tatapudi Gopikrishna Vasista¹, Ramakrishna N. Hegde¹, Praveen B. M.²

¹Department of Civil Engineering Institute of Engineering & Technology, Srinivas University, Mangaluru

²Department of Chemistry, Srinivas University, Institute of Engineering & Technology, Mukka, Srinivas Nagar, Mangaluru - 574146, India.

Abstract: While there are benefits that can be achieved from the construction industry, it is considered to be one of the biggest contributors of creating environmental problems impacting human sustainability. Nanotechnology has the potential to make smart city construction faster, safer and cheaper. Therefore, nanotechnology is insisting construction industry to use efficient nano materials in the smart city construction and providing smart infrastructure in urban areas. For example, nanotechnology can be used to sense cracks in foundation structures and can send nanobots to repair them. However, application of nanotechnology in terms of using nano- materials can also impact construction worker health and safety, the following objectives of this paper are set to conduct exploratory research of finding answers to the following three research questions (i) what are the applications of nanotechnology in construction industry? (ii) how to sense the cracks in foundation construction structures and repair them? (iii) how to provide safety to construction workers who use nanotechnology?

Keywords: Applications of nanotechnology, Construction Repairs with nanobots, Construction safety and health, Exploratory research methodology, Nanomaterials, Sensing construction cracks

ID-18: Satellite Image Classification: An Analysis Using Machine Intelligence Based Approach to Support Internet of Things

Kalyan Kumar Jena^{1*}, Krishna Prasad K.², Sourav Kumar Bhoi¹

¹Institute of Computer Science and Information Science, Srinivas University, Mangaluru-575001, Karnataka, India

²Institute of Computer Science and Information Science, Srinivas University, Pandeshwar, Mangaluru-575001

Abstract: Satellite images (SIs) play a major role for the meteorologist and forecasters to carry out analysis to support many applications such as surveillance, Internet of Things (IoT), etc. It can help in providing the useful information regarding changes in land cover, growing of crops, location of fire burning, etc. It is very much essential for the proper classification of SIs into several categories such as Cloudy, Desert, Green area, Water, etc. so that appropriate information can be provided to the meteorologist as well as forecasters for further analysis. In this work, a machine intelligent (MI) based approach is proposed for the classification of satellite images (SIs) into the Cloudy, Desert, Green area and Water types. This approach is focused on the machine learning (ML) based methods such as Logistic Regression (LRG), Support Vector Machine (SVMN), Random Forest (RFS), Neural Network (NNT), Decision Tree (DTR), AdaBoost (ADB), Naïve Bayes (NBY), K-Nearest Neighbor (KNNH) and Stochastic Gradient Descent (SGDC) to carry out such classification. The ML based methods have been implemented using Python based Orange 3.26.0. In this work, 1000 SIs having 250 numbers of each type such as Cloudy, Desert, Green area and Water are taken from the Kaggle source. The performance of all the methods is assessed using the performance parameters such as classification accuracy (CA), F1, Precision (PR) and Recall (RC). From the results, it is found that the LRG method is capable of providing better classification results in terms of CA, F1, PR and RC as compared to other ML based methods such as SVMN, RFS, NNT, DTR, ADB, NBY, KNNH and SGD.

Keywords: Satellite Image, Machine Learning, Classification Accuracy, F1, Precision, Recall

ID-19: Internet of Things Enabled Unmanned Aerial Vehicle Based Forest Fire Detection Using Machine Intelligent Cloud System

Sourav Kumar Bhoi^{1*}, Krishna Prasad K.², Kalyan Kumar Jena¹

¹Institute of Computer Science and Information Science, Srinivas University, Mangaluru-575001, Karnataka, India

²Institute of Computer Science and Information Science, Srinivas University, Pandeshwar, Mangaluru-575001

Abstract: Detection of forest fire is a very important topic for saving the environment from getting damaged. If the forest fire is not detected accurately in time, then it may result in reduction of forest coverage, increase of air pollution and temperature, damage of habitats of animals, etc. In this work, an Internet of Things (IoT) enabled unmanned aerial vehicle (UAV) based forest fire detection using machine intelligent cloud system is proposed to detect the forest fire at early stage using UAV captured images. The UAV enabled with IoT technology does surveillance of the forest areas that looks smoky with fire. The forest fire images captured by the UAV are continuously sent to a cloud node for classification of the images as forest fire or no forest fire. The machine learning based classification is performed at the cloud using a best supervised machine learning model. The best model is selected by training and testing several supervised models with a standard forest fire detection image dataset. The image dataset consists of forest fire and no forest fire images. From the result, it is found that Neural Network model performs better than other standard supervised models with by showing a classification accuracy of 97.90 %. This system will be a better proposal for detection of forest fire with high accuracy using IoT enabled UAV in a cloud-based machine intelligent system.

Keywords: Forest Fire Detection, IoT, UAV, Machine Learning, Cloud System

ID-20: Synthesis, Characterization and single crystal X Ray studies of 1,5-Diketones: Application in the Synthesis of 1,5-trifluoromethyl pyridine DerivativeMadan N.¹, Sunil K. a *, Yamuna I K.²¹Department of Chemistry, Sri Siddhartha Academy of Higher Education, Tumkur-572107²Department of Chemistry, Coorg Institute of Technology, Halligattu, Kodagu-571216

Abstract: Synthesis of Diketones and its derivatives are one of the most significant classes of compounds. A number of drugs having the heterocyclic moieties, such as pyrazole and its derivatives, isoxazole, carbazole derivatives, imidazole and thiazole and its derivatives etc. are the recognized drugs compared to various infirmities and are synthesized via a diketone intermediate. Also, researchers have found various new compounds containing heterocycles containing 1,3 diketones, 1,4 diketones, 1,5 diketones; specially pyrazole and pyridine, so biologically active as could be considered as promising ligands for future drugs. 1,5-diketones compound show various biological activities towards anti-inflammation, antitumor, antidiabetic, and antiinfection properties. They are all were reported as the key intermediates for the preparation of substituted pyridine derivatives, quinolone derivatives pyrylium and thia-pyrylium derivatives. In this context, a facile and green method for the preparation of 1,5-diketone of trifluoromethyl pyridine derivative by Claisen Schmidt condensation was developed. Highly substituted 1,5-diketones of trifluoromethyl pyridine derivative was synthesized, via the reactions between ketones and aldehydes and the subsequent dimerization using aqueous KOH as catalyst. 1,5-diphenyl-3-[5-(trifluoromethyl)pyridin-2-yl]pentane-1,5-dione The main advantages of these reactions over existing reactions are better yields, faster reaction rates, and we can follow simple workups with efficient reaction.

Keywords: Synthesis of Diketones, heterocyclic moieties, antitumor, antidiabetic

ID-21: Food fortification in bakery –a needed great innovation

D. Padmavathi and B.M. Praveen^{1*}

¹Department of Chemistry, Srinivas University, Institute of Engineering & Technology, Mukka, Srinivas Nagar, Mangaluru - 574146, India.

Abstract: Fortification is the practice of deliberately increasing the content of one or more micronutrients (i.e., vitamins and minerals) in a food or condiment to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health. Food fortification became commonplace during the First and Second World Wars to help prevent nutritional deficiencies within the population, and to replace nutrients that were lost during food processing. As stated, the Codex Alimentarius Commission definition of fortification is, the addition of one or more essential nutrients to a food whether or not it is normally contained in the food, for the purpose of preventing or correcting a demonstrated deficiency of one or more nutrients in the population or specific population. Food fortification with multiple micronutrients may reduce anemia, iron deficiency anemia and micronutrient deficiencies (iron, vitamin A, vitamin B2 and vitamin B6) as well as some motor and cognitive outcomes. Micronutrients' fortification may also improve child growth measures. Fortification of wheat flour with folic acid may reduce the risk of neural tube defects and may increase erythrocyte and serum/plasma folate concentrations. Fortification of wheat flour with iron may reduce anemia in the general population. Staple foods may be fortified with vitamin D for the prevention and reduction of nutritional rickets. Fortification of foods with zinc may improve the serum zinc status. There are no reported side effects associated with single or micronutrients fortification. So this paper focus out the need, importance, regulations and principles of fortification in detail.

Keywords: Food, Health, Nutrition, Fortification, Deficiencies, Nutrients and Bioavailability.

ID-22: “NANOTECHNOLOGY”- a great valuable boon for bakery packaging

D. Padmavathi and B.M. Praveen^{1*}

¹Department of Chemistry, Srinivas University, Institute of Engineering & Technology, Mukka, Srinivas Nagar, Mangaluru - 574146, India.

Abstract: Implementation of nano packaging in bakery items, and to assess its shelf life and nutritional quality. Methodology: food packages embedded with nanoparticles can alert the consumer demands about the safety of the foods. It can release preservatives to extend the shelf life of food in packages. The present study adopted bakery products for different types of nano packages such as modified atmosphere packaging, improved packaging, active packaging, and smart packaging. The nano-based bakery samples were assessed for its shelf through microbial analysis of proper channels. Each sample need a duration of 5 to 1 week to assess its shelf-life nature. The best accepted self-life of nano-based food samples were evaluated for its nutritional quality in terms of both macro and micro nutrients. The analysis was planned to be carried out in micro labs Vellore, because of its quality excellence and also due to the familiarity of the investigator. Results & Findings: The Nano based food products were forwarded to shelf-life analysis to reveals the best item. The Best shelf-life Nano based baked goods were further planned to subjected for Nutritional analysis too.

Keywords: Nanotechnology, Nano food packaging, Human health, Bakery products, Shelf life, Nutrient analysis.

ID-23: Nanotechnology-based Carbon Capturing Systems – An Industry Analysis

Shubhrajyotsna Aithal¹, & P. S. Aithal²

¹Institute of Engineering and Technology, Srinivas University, Mangalore, INDIA

²Institute of Management and Commerce, Srinivas University, Mangalore – 575 001, INDIA

ABSTRACT: Environmental degradation is a serious challenge in the process of controlling climate change which leads long term shifts in temperature and weather patterns. Out of many solutions to control climate change, the essential and implementable solution is controlling the green gases including carbon dioxide in the atmospheric air. Though there are many technologies to decrease Carbon content in the air, it is found that nanotechnology-based carbon-capturing solutions are the most promising and effective. Carbon capturing technology based on nano- porous filters is an effective process in eliminating carbon contents from atmospheric air. However, effective commercialization of such devices at large and mega-scale is yet to be developed and commissioned. In this industry analysis paper, we have identified and analyzed some of the trending Carbon capturing companies and their solutions. This includes, (1) Carbon Engineering, Canada, (2) Lanza Tech, New Zealand, (3) Clime works, Switzerland, (4) Aker, Norway, (5) CarbonFree, USA, (6) Carbfix, Iceland, (7) Global Thermostat, USA, etc. The paper also discusses and analyze the strategies of various investors to realize the goal of capturing and utilizing up to 100 million tons of carbon dioxide annually by 2040. Based on the principles used in their devices, the advantages, benefits, constraints, and demerits of such products are discussed. Based on the analysis a new interpretation of the solution process is suggested.

Keywords: Environmental pollution, Climate change, Carbon capturing technology, Carbon capturing systems, Carbon capturing industry, Carbon capturing companies, Nanotechnology, Nanofillers

ID-24: Adopting Universal Research Methods in Nanotechnology Research – An Opportunity Analysis

Shubhrajyotsna Aithal¹, & P. S. Aithal²

¹Institute of Engineering and Technology, Srinivas University, Mangalore, INDIA

²Institute of Management and Commerce, Srinivas University, Mangalore – 575 001, INDIA

ABSTRACT: Every research methodology focuses on creating new knowledge or interpreting the existing knowledge in a new way through systematic analysis. The research methodology consists of a systematic procedure of finding the solution to a chosen research problem. Research methodology usually consists of one or more objectives and one or more research methods to find a solution in the form of new knowledge or new interpretation. There are 3 research methods usually followed in scholarly research and they are (1) Experimental research methods, (2) Empirical research methods, and (3) Exploratory research methods. Experimental research usually uses an instrument to measure the relationship between two sets of variables in a controlled environment by keeping one set as constant and measuring the other set with the intention to prove a hypothesis in the process of finding a solution to a research problem under consideration. Empirical research is based on observation of real-life situations and data or information are collected through a systematic survey may be through questionnaires or interviews and analysis of it through some statistical means to prove a hypothesis in the process of finding a solution to a research problem under consideration. Exploratory research is based on a deep understanding or exploring a problem and around it with an intention of understanding a problem and interpreting it in a new way through systematic analysis. Qualitative research including Focus group analysis, Case study, etc uses exploratory research methods. Nanotechnology is considered as a universal technology and capable to solve both physical and social problems of society. Moreover, it has applications in primary, secondary, tertiary, and quaternary industries to improve the quality of life of human beings. In this paper, we have discussed the possibility of using experimental, empirical, and exploratory methods (universal research methods) in nanotechnology research to find solutions to different types of physical and social problems as researcher's opportunity.

Keywords: Nanotechnology, Universal research methods, Experimental research methods, Empirical research methods, Exploratory research methods, Opportunity analysis

ID-25: Adopting SDG and Green Technology in Environmental Studies Syllabus of UG Engineering Programme as Common Subject – An Innovation and Best Practice of Srinivas University

Shubhrajyotsna Aithal¹, & P. S. Aithal²

¹Institute of Engineering and Technology, Srinivas University, Mangalore, INDIA

²Institute of Management and Commerce, Srinivas University, Mangalore – 575 001, INDIA

ABSTRACT: Environmental education is important in higher education curricula in order to create an awareness of maintaining a sustainable clean and green environment for future generations. As per University Grant Commission (UGC) mandatory requirement of offering environmental Studies in all undergraduate programmes, students of first year engineering programmes also study this subject. Srinivas University, being a State private university has the autonomy to make innovations in designing curriculum, pedagogy of teaching-learning process, and evaluation methods. Accordingly, the syllabus of environmental studies as a common subject of first year engineering programme is designed and delivered in an innovative way as one of the best practices of the academic teaching-learning process. The subject consists of a detailed study of (1) Environmental and Human activities, (2) Energy and usage, (4) Green technology including green nanotechnology, (4) Environmental pollution including air, water, and noise pollution, (5) Objectives and implementation of United Nations Sustainable Development Goals. The pedagogy consists of class lectures, student presentations, and experiential learning practices. The evaluation method consists of a continuous evaluation with multiple choice questions and compulsory student presentations to make them responsible to maintain a good sustainable environment for future generations. The paper consists of the efforts of Srinivas University to design and offer environmental studies as a general common paper to first year engineering students and implement it effectively as a best practice. The paper is structured with review of the literature, objectives of the innovation and best practices, the context, the practice, teaching pedagogy and methods, experiential learning, evidence of success, problems encountered and resources used, analysis and scope of improvements, and conclusion.

Keywords: Innovation in engineering education, Best Practice in Curriculum Design, Environmental Studies, Common subjects in Engineering, UN's SDG, Green technology, green nanotechnology

ID-26: Nanocrystal & Nanofiber Systems for Nonlinear Optical Limiting Applications –Review-based Research Agendas

Shubhrajyotsna Aithal¹, & P. S. Aithal²

¹Institute of Engineering and Technology, Srinivas University, Mangalore, INDIA

²Institute of Management and Commerce, Srinivas University, Mangalore – 575 001, INDIA

ABSTRACT: Materials and systems which show higher nonlinear optical properties potential candidates for the construction of Optical limiters for controlling the intensity of laser beams and have importance in many industrial applications. It is anticipated that nanomaterials in the form of nanocrystals and nanofibers with their enhanced and controllable nonlinear optical properties can be used to develop a system to control the intensity of optical/laser beam in many industrial applications. A nanocrystal is a crystalline particle of nano-size where at least one dimension measuring less than 1,000 nm. They are nanoparticles with crystalline characters. Nanocrystals are used for various applications including oil filters, solar panels, smart materials, memory chips, hydrogen production, drug manufacturing, medical imaging, etc. Similarly, a nanofiber is a fiber with diameter in between 1 nano meter and 1,000 nano meters with aspect ratio more than 50. Nanofibers can be produced by different materials including different polymers. Nanofibers have potential applications in drug delivery, cancer diagnosis, tissue engineering, seed-coating, lithium battery fabrication, filters, sensors, formation of various composites, etc. In this research work, we made an attempt to study the possible system of design and development of nonlinear optical power limited using the cumulative properties of nanocrystals and nanofibers. Then nonlinear absorption properties of such systems can be varied and controllable by varying the thickness of the system and hence the effective width of laser beam passage. The various possible research agendas to develop an optimum optical power limiter for CW and pulsed laser beams of specified intensity and wavelengths are also suggested based on review of many scholarly literature.

Keywords: Nonlinear optical processes, Nonlinear optical materials, Nonlinear optical systems, Optical limiters, NLO limiters, Nonlinear absorption of light, nanocrystals, Nanofibers,

ID-27: A Critical examination of the bonding shared by Lakshmibai and Ellis in the novel RANI.

Minumol M S¹, Bhuvana Ramachandran¹

¹Institute of Social Science and Humanities, Srinivas University, Mangalore, Karnataka, India

Abstract: “Khoob ladi mardani, woh tho Jhansi waali Rani Thi.”- Subhadra Kumari Chauhan Jhansi ki Rani Lakshmibai is one of the most well-known women warriors in the history of India. She was a brave, courageous woman and has inspired millions of people and had an independent personality. Her heart and mind were always for the welfare, emancipation of people of Jhansi. The history will always remember the way she fought against the British company. She got on to the peak of glory that even her foes also admired her courage and smartness. The students are taught about Lakshmibai so that they could grow up with inspiring stories of bravery. Lakshmibai has won the hearts of people for her sagacious approach. She used to invite women from all caste for celebrations like Makarsankranti, Chaitra etc. It was an important step towards social justice. People started to call her “Bhai sab”. It was a bold step which even in the 21st century one is scared to take. This paper aims at finding the relationship shared between Rani and Ellis in the novel Rani.

Keywords: - warrior, friendship, patriotism, bonding

ID-28: Effect of different fiber reinforcement and matrix ratios in Hybridization of Jute fiber in Banana fiber polymer composites

Vishwas C Shetty^{1*}, Nikhil Nayak¹

¹Department of Materials Science & Engineering, Institute of Engineering & Technology, Srinivas University

Abstract: Jute fiber reinforced composites (JFRCs) present hurdles for composite manufacturers because of the high cost of dry fiber preforming and lower fiber performance compared to other commonly used natural plant fibers such as kenaf, sisal, flax, and hemp. Consequently, the performance requirements of the composites are frequently unmet by long fiber architecture jute fiber preforms. Jute fibers that are shorter in length can be made into dry pre-forming sheets, which are then used to manufacture complicated composite goods with cheap processing costs and greater fiber reinforcing effects. In order to support the structural load, reinforcement offers strength and stiffness. The reinforcements position and orientation are maintained by the polymer matrix or binder. It's important to note that while the composite's separate components retain their own physical, chemical, and biological characteristics when combined, they provide a range of traits that any one component couldn't produce on its own. The choice of raw materials (banana, jute) is often excellent in all respects and readily accessible. For the creation of the hybrid banana composite material in this project, both treated and untreated banana fiber and jute fiber are used. The samples cut according to ASTM standards are tested for mechanical properties and the fiber and matrix in the ratio 70:30 showed good results as compared to other compositions.

Keywords: Jute fiber, Jute fiber reinforced composites, hybrid banana,

ID-29: A review of patents on work related to the improvement of mechanical properties of natural fiber composites

Vishwas C Shetty¹

¹Institute of Engineering & Technology, Srinivas University, Mukka – 574 146, Mangaluru.

Abstract: Composite materials used for various structural applications involve the usage of various plant-based natural fiber reinforcements replacing synthetic fibers. The essential replacement of synthetic fiber with NFCs (Natural Fiber Composites) makes the composite more suitably adaptable for the environment in terms of biodegradability. Overcoming the factors like low modulus and strength properties as compared to synthetic fiber-reinforced composites is the key role of research in this area. Cost-effectiveness, biodegradable nature and better mechanical properties are the advancements to be focused on. Tremendous efforts have been made for substituting conventional petroleum-derived plastics to develop biodegradable materials. Various methods have been devised and patented to make natural fiber more suitably acceptable in replacing synthetic fiber for mass production. Among the advancements, molded pulp products made from wood fibers and recycled papers have been sought after. Plant fibers comprising short and long fibers like jute, hemp, sisal, bamboo, sugarcane, banana, and pineapple, and also the combinations of these are used for the manufacture of these composites. These are mainly used in waterproof fiberboards, and Bakelite powder plastic wood fiber plates. Identifying the progress in the field of continuous natural fiber-reinforced composites and establishing a foundation in this area is facilitated by this review.

Keywords: Natural Fiber Composite; Bio-degradable; Plant fibers; Mechanical properties.

ID-30: Electrodeposition of rhodium coatings on SS304 and their application towards photocatalytic dye degradation

Bharath K. Devendra ^{1,2}, B.M. Praveen ^{1*}, and Naveen Kumar J.R.³

¹Department of Chemistry, Srinivas University, Institute of Engineering & Technology, Mukka, Srinivas Nagar, Mangaluru - 574146, India.

²Department of Chemistry, M. S. Ramaiah College of Arts, Science and Commerce, MSRIT Post, MSR Nagar, Bengaluru - 560 054, India.

³Department of ECE, AIML & NT, Srinivas University, Institute of Engineering & Technology, Mukka, Srinivas Nagar, Mangaluru - 574146, India.

Abstract: The method for electroplating a specific composition of rhodium coating on a stainless steel (SS304) metal substrate is described in this article. The Rh bath is composed of Rh₂(SO₄)₃ and acidic medium that has been diluted with H₂SO₄. The Rh electrodeposition coatings were characterized using analytical techniques like atomic force microscopy (AFM) and scanning electron microscopy (SEM). In 75% of the duty cycle, the coating is uniform according to SEM pictures. AFM is used to calculate the coatings average roughness. The inclusion of the Rh metal ions was verified by EDX tests. Under UV light, research on the photocatalytic degradation of Rh coating for Methylene Blue (MB) dyes was conducted. A PC with a 75% duty cycle showed a 95% dye degradation, which is higher than the DC coatings 90%. A UV-Vis spectrophotometer was used to analyze every aspect of photocatalytic behaviour.

Keywords: Rhodium, SS304, SEM, AFM, EDX, Photodegradation.

ID-31: An efficient material for photocatalytic application: The electrodeposition method for the development of a Pt-Rh alloy coating

Bharath K. Devendra ^{1,2}, B.M. Praveen ^{1*}, and Naveen Kumar J.R.³

¹Department of Chemistry, Srinivas University, Institute of Engineering & Technology, Mukka, Srinivas Nagar, Mangaluru - 574146, India.

²Department of Chemistry, M. S. Ramaiah College of Arts, Science and Commerce, MSRIT Post, MSR Nagar, Bengaluru - 560 054, India.

³Department of ECE, AIML & NT, Srinivas University, Institute of Engineering & Technology, Mukka, Srinivas Nagar, Mangaluru - 574146, India.

Abstract: This article describes a technique for electroplating a platinum-rhodium (Pt-Rh) alloy coating with a specific composition on a stainless steel (SS304) metal substrate. The components of the Pt-Rh bath are $[\text{Pt}(\text{NH}_3)_2] \text{HPO}_4$, H_2SO_4 , and $\text{Rh}_2(\text{SO}_4)_3$. Different analytical techniques, including Scanning Electron Microscopy (SEM) and X-ray diffraction (XRD), were used to evaluate the Pt-Rh alloy electrodeposition coatings. The uniformity of the coating at 75% duty cycle is supported by SEM pictures. According to XRD, the crystalline size of the PCs remaining coatings and DC has decreased from 75% duty cycle (Direct current). By using EDX studies, the incorporation of the Pt-Rh metal ions was confirmed. A photocatalytic degradation study of Pt-Rh coating was conducted for Methylene Blue (MB) dyes under UV light radiation. PC 75% duty cycles showed an exceptional dye degradation percentage compare to DC coating source. All photocatalytic behaviour was controlled by using UV–Vi's spectrophotometer.

Keywords: Platinum-Rhodium, SS304, SEM, XRD, Dye degradation.

ID-32: Study on the development of platinum coating by the electrodeposition method and its application in the generation of hydrogen

Bharath K. Devendra ^{1,2}, B.M. Praveen ^{1*}, and Naveen Kumar J.R.³

¹Department of Chemistry, Srinivas University, Institute of Engineering & Technology, Mukka, Srinivas Nagar, Mangaluru - 574146, India.

²Department of Chemistry, M. S. Ramaiah College of Arts, Science and Commerce, MSRT Post, MSR Nagar, Bengaluru - 560 054, India.

³Department of ECE, AIML & NT, Srinivas University, Institute of Engineering & Technology, Mukka, Srinivas Nagar, Mangaluru - 574146, India.

Abstract: A thin layer of platinum coating ($0.5 \mu\text{gcm}^{-2}$) on stainless steel surface was deposited by direct current (DC) and pulse current (PC) electrodeposition method for hydrogen evolution reaction (HER) application. The coatings were characterized using scanning electron microscopy (SEM), atomic force microscopy (AFM), and X-ray diffraction (XRD) analyses. For these coatings, experiments using linear sweep voltammetry (LSV) and cyclic voltammetry (CV) were conducted to determine the overpotential values for the hydrogen evolution reaction (HER). The entire cost can be decreased by optimizing the catalytic activity for hydrogen evolution utilizing various coating techniques. Tafel polarization experiments were conducted for DC and PC platinum coating to know hydrogen generation trend. Cathodic slope and HER current values revealed that, coatings obtained at 75% duty cycle by PC method exhibit lower cathodic slope, high current density of 150 mA/cm^2 and more corrosion current with highest hydrogen evolution. Chronopotentiometry experiments showed that 20 ml of hydrogen collected by for 75% sample.

Keywords: Electrodeposition, Platinum, HER, LSV, Chronopotentiometry.

ID-33: Spondias mombin (Hog plum) mediated ZnWO₄ - CuWO₄ nanocomposite for photocatalysis

V. Pavitra ¹, B.M. Praveen ¹

¹Dept. of Nanotechnology, Institute of Engineering & Technology, Srinivas University, Mukka, Mangaluru-574146

Abstract: ZnWO₄ -CuWO₄ composite has been synthesised using novel fuel Spondias mombin (hog plum) by the simple, environmentally benign, and economically viable combustion method towards photocatalytic dye degradation. A variety of characterization techniques have been used to analyze the prepared composite for the structure and morphology. The results of UV- DRS and BET are used to compute band gap energy and surface area. In the presence of visible light interactions, the photocatalytic research of the binary tungstate ZnWO₄ -CuWO₄ has demonstrated higher increased outcomes when compared to individual tungstates towards methylene blue (MB) dye degradation for the elimination of the effluent, an acidic environment is more favorable.

Keywords: Nanocomposite, Tungstate's, Photocatalytic dye degradation.

ID-34: Humidity and Nitrite sensing studies of h-MoO₃ flowery nanomaterials

V. Pavitra ¹, B.M. Praveen ¹

Dept. of Nanotechnology, Institute of Engineering & Technology, Srinivas University
Mukka, Mangaluru-574146, Karnataka, India.

Abstract: Simple, low temperature reflux has been used to prepare the self-assembling hexagonal rods of h-MoO₃ flowers. By using XRD and UV-vis DRS analytical techniques, the mean crystallite size and band gap (E_g) has been calculated. The simple and novel material synthesis provides unique morphology of hexagonal rod-shaped h-MoO₃ flowers. The modified glassy electrode of h-MoO₃ has demonstrated the sensing activity with a limit of detection value of 0.196 M for 1 mM nitrite sensing. The h-MoO₃ flowery material had a high humidity sensing response of 97.9% shows that it is ideally suited for industrial applications.

Keywords: Reflux method, h-MoO₃, hexagonal rods, Humidity sensor.

ID-35: Spondias mombin (Hog plum) mediated ZnWO₄ - CuWO₄ nanocomposite for electrochemical nitrite sensing

V. Pavitra ¹, B.M. Praveen ¹

Dept. of Nanotechnology, Institute of Engineering & Technology, Srinivas University
Mukka, Mangaluru-574146, Karnataka, India.

Abstract: By using the unique novel fuel Spondias mombin (hog plum), ZnWO₄-CuWO₄ composite has been developed for electrochemical nitrite sensing via a simple, ecologically friendly, and economically viable combustion approach. The prepared composites have been examined structurally and morphologically through numerous characterization techniques. Band gap energy and surface area are calculated using the UV-DRS and BET findings. The ZnWO₄-CuWO₄ nanocomposite modified glassy carbon electrode (GCE) has a detection limit of 26.09 M for the detection of 5 mM nitrite.

Keywords: Nanocomposite; Tungstate's; XRD; TEM; Electrochemical nitrite sensing

ID-36: Spectrophotometric determination of Platinum (IV) using potassium ferrocyanide as a reagent

Gopalakrishna Bhat N¹ and B. Narayana²

¹Department of Chemistry, Srinivas Institute of Technology, Mangaluru-574143

²Department of Studies in Chemistry, Mangalore University, Mangalagangothri-574199

ABSTRACT: A simple and rapid spectrophotometric method for determination of platinum has been developed using potassium ferrocyanide as a reagent. The blue colored 1:1 complex is formed shows the absorption maximum at 420nm. The method is free from interference from many of the associated metal ions. It obeys the Beer's law in the range 4-44ppm of Pt(IV) with molar absorptivity and Sandel's sensitivity of $4.94 \times 10^3 \text{ L mol}^{-1} \text{ cm}^{-1}$ and $0.039 \mu\text{g cm}^{-2}$, respectively. Analysis of various alloys has been carried out satisfactorily.

Key words: Spectrophotometry, potassium ferrocyanide and Platinum (IV)

ID-37: Synthesis of copper nanofluids for enhanced thermal conductivity via one pot solution phase method

U. Sandhya Shenoy^{1*} and D Krishna Bhat^{2*}

¹Department of Chemistry, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore, Karnataka, India

²Department of Chemistry, National Institute of Technology Karnataka, Surathkal, Mangalore, Karnataka, India

Abstract: Nanofluids have been attracting great attention due to their ability to enhance the thermal conductivity of the base fluids for application in heat transfer. Precise control over the shape and size of the particles dispersed in the conventional fluids is highly essential to achieve the desired output. In this work, we employ a one pot solution phase synthesis for dispersion of copper particles in nanoform in a mixture of 1:1 ethylene glycol and water. Ascorbic acid was used to reduce copper sulphate in the presence of sodium dodecyl sulphate (SDS). SDS acted as a capping agent restricting the size of the particles formed in nonorange and helped in dispersing the copper particles formed in the base fluid uniformly. Diffraction and microscopy techniques used to study the prepared nanofluids revealed presence of copper nanocubes of 40 nm edge length. Sedimentation measurements at room temperature revealed the fluids had a stability of over 6 weeks. The rheological measurements revealed the nanofluid to be Newtonian in nature. The thermal conductivity of $1.7 \text{ Wm}^{-1} \text{ K}^{-1}$ at $30 \text{ }^\circ\text{C}$ measured was attributed to the nano size, high conductivity and stable dispersion of the copper particles in the base fluid. Thus, the synthetic technique provided a method for large scale preparation of heat transfer fluids for thermal management systems.

Keywords: Nanofluids; Copper; Solution Phase Synthesis; Thermal Conductivity.

ID-38: A Study on Mechanical Properties of Hybrid Banana Fibre Reinforced Wood Powder Composites

Ajay Noronha¹

¹Dept of MBA, Institute of Engineering & Technology, Srinivas University, Mukka, Mangaluru

Abstract: Characteristic fiber composites are these days being utilized as a part of different designing applications to build the quality and to advance the weight and the cost of the item. Natural fiber Composites are progressively utilized to replace wood and its applications in various fields. Aim of the project is to find the best combination of Natural Fibre and Resin percentage by preparing various composites and carrying out mechanical tests on them. NFCs are these days being utilized as a part of different designing applications to expand the quality and to improve the weight and the cost of the item. Different natural fibers are available naturally for example; coir, sisal, jute, coir and banana are utilized as reinforcing materials. In this project banana fiber will be acting as reinforcement and Epoxy resin for the composite. The frame mould fabricated to make composite material is comprised of mild steel in which the fibbers and matrix (resin) are distributed in required volume fractions. The banana fiber percentage is varied for different samples of composites. The variety in mechanical properties are considered and examined. The composite samples will be tested for tensile and flexural test in a Universal Testing Machine and the results are plotted and compared in order to differentiate the strength of each specimen.

Keywords: Mechanical properties, composites, Natural fiber

ID-39: Newly synthesised Schiff's base derivative on mild steel in acid medium

Shashirekha K^{1,2}, Shubhrajyotsna Aithal¹, B.M. Praveen¹

¹Department of Chemistry, Srinivas University, College of Engineering & Technology, Mukka, Karnataka, Mangaluru

²Department of Chemistry, Yenepoya Institute of Technology, Moodabidri, Karnataka, Mangaluru

Abstract: The corrosion inhibition of mild steel in 1M HCl by Schiff's base been studied using Electrochemical polarization and Electrochemical impedance spectroscopic measurements. Tafel polarization curves reveal that the used compounds are mixed type inhibitors. Result showed that inhibition efficiency increases when increase the concentration and decreases with increase in temperature. Surface morphology was discussed by using Scanning Electron Microscopic (SEM) studies. Experimental inhibition efficiencies were correlated with quantum chemical parameters.

Keywords: Corrosion, Schiff's base, mild steel, corrosion rate, SEM.

ID-40: DeepQ based Facial Recognition System in Vanish Lighting Condition using Convolutional Neural Network

A. Sasi Kumar ^{1&2} & P.S. Aithal ^{3&4}

¹Institute of Computer Science & Information Science, Srinivas University, Mangalore-575 001, India.

²Department of Cloud Technology & Data Science, Institute of Engineering & Technology, Srinivas University

³Institute of Management & Commerce, Srinivas University, Mangalore-575001, India.

⁴Institute of Computer Science & Information Science, Srinivas University, Mangalore-575001, India.

Abstract: Purpose: The main purpose of this method is to verify the hard light face by combining the intensity of the solid light, kernel-based feature, and distance-based conversion, Gabor feature, phase component feature and many other features. DeepQ based Facial Recognition System in Vanish Lighting Condition. This method removes unwanted light effects such as poor lighting - uniform, shadowing, noise, blurring and blurring-chain chain, this method describes our standard lighting method that eliminates the effects of light change. Local ternary (LTP) patterns, typical binary local pattern (LBP) local terminology is very discriminatory and less sensitive to noise in the same areas.

Keywords: Facial Recognition Systems, Vanishing Point, Lighting Conditions, Convolution Neural Network, Matlab

ID-41: Artificial Associated Neural Network method for Detection of Multimodal Person Authentication using TensorFlow

A. Sasi Kumar ^{1&2} & P.S. Aithal ^{3&4}

¹Institute of Computer Science & Information Science, Srinivas University, Mangalore-575 001, India.

²Department of Cloud Technology & Data Science, Institute of Engineering & Technology, Srinivas University

³Institute of Management & Commerce, Srinivas University, Mangalore-575001, India.

⁴Institute of Computer Science & Information Science, Srinivas University, Mangalore-575001, India.

Abstract: Purpose: The purpose of verifying the authenticity of multiple items is to accept or reject a claim for a person's identity using one or more personalities associated with the person. In this work visual and verbal expression is used for personal verification. Properties such as Deep Q (vertical, Horizontal, diagonal) are extracted from the mouth area compared using the performance scale. Extruded acoustic features and visual acuity are used to create individual artificial associative Neural Network (AANN). The identity of a person's identity is determined based on a trusted result from AANNs.

Keywords: Artificial Associated Neural Networks, Acoustic Features, Visual Speech Synthesis, Multimodal System, Deep Q-Residue

ID-42: Green Synthesis of ZnO nano-particles by Precipitation method and study their optical property.

Nataraja G^{1*}, Praveen B M² and Ganesh N. Yallappa³

^{1*,3} Department of Chemistry, Jain Institute of Technology, Davangere-577005, Karnataka, India.

²Department of Chemistry, Srinivas University, Mangaluru, Karnataka, India.

Abstract: Nano ZnO particles possess different physical properties enhanced due to their structural surface area. In this work, we reported the green synthesis by using Curry leaves extraction which acts as a green catalyst for the precursors Zinc nitrate. The precipitation method is a simple and efficient method which led the formation of ZnO nanoparticles. After the synthesis, characterizations like SEM analysis, XRD analysis & FT-IR were confirmed the structure and purity. Since physical properties of nanoparticles are in scope for the advanced applications, we focused on the study of optical absorbance by the spectra UV-DRS. Absorbance of pure ZnO NPs is higher in the range of 200-400nm. Doped ZnO NPs shown low absorbance in 200-400nm whereas it is increased as the wavelength shifted from 400-800nm.

Keywords: Zinc nitrate, Green Synthesis, nanoparticles,

ID-43: A Brief Review on the Role of Nanostructured Electrodes in Production of Green Hydrogen

¹Canute Sherwin, ¹Purushothama Chippar

¹Department of Mechanical Engineering, St. Joseph Engineering College, Vamanjoor, Mangaluru-575028, India

Abstract: There has been a large surge in demand and utilization of fossil fuels as an energy source over the past decade around the globe leading to increased pollution levels. This is due to the release of greenhouse gasses and other pollutants into the environment. Over the past few decades, researchers around the world are looking for an eco-friendly alternative source of energy. Hydrogen energy is proving to be one such alternative source due to its versatility in application. Green hydrogen involves the use of renewable sources of energy to produce hydrogen and oxygen through water splitting in an electrolyte. Industrially, this process of water splitting into hydrogen and oxygen demands high energy, leading to large investments. The development of advanced nanostructured electrodes that serve as electrocatalysts in water splitting process is thus being studied by scientists worldwide. This paper reviews the different electrodes (electrocatalysts) investigated and developed globally in the last decade for hydrogen production through electrolytic route. The classical catalysts used for electrolytic water splitting like iridium and platinum are very expensive. Replacing them with nanostructured cost-efficient electrodes is the need of the present day. The nanostructure of the electrode is observed to increase the operational surface area, increasing its efficiency. It is believed that increasing the production and utilization of green hydrogen is expected to achieve net-zero emissions by 2050.

Keywords: Green hydrogen, electrode, nanostructure, electrocatalyst, iridium and platinum.

ID-44: The Effect of Radiation upon the Environment

Abhinav B.¹, Bhuvana Ramachandran^{1*}

¹School of Social Science and Humanities, Srinivas University, Mangalore, Karnataka, India.

Abstract: Purpose: The way that people express their sentiments and emotions is always evolving. The market has been thoroughly dominated by technology that is moving from 4G to 5G the fastest. The business now has a fantastic potential to profit from nature and its inhabitants. It is essential to develop for the sake of the economy, but it is also crucial to thoroughly examine and prevent any harm done to nature. Design/Methodology/ Approach: Construct a theoretical framework based on investigating the variation in radiation and how it affects the environment using both primary and secondary data obtained from visits to bird wildlife sanctuaries and a variety of sources, including online journals, research articles, and publications, respectively. Findings/Result: According to estimates, bird life is significantly impacted. As a result, there are more insects and flies, which eat plants. As a result, the environment loses its greenery since the leaves are killed. Other factors that have an impact on the environment have also been found. Originality/Value: This Paper aims to investigate how radiation energy affects the environment and the animals that inhabit it. This study aims to establish a sustainable kind of energy to improve the economy by proposing to apply its findings beyond the boundaries of current knowledge and comprehension. Paper Type: Exploratory research.

Keywords: Radiation, technology, 4G to 5G, nature, sanctuaries

ID-45: Social media's impact on Indian tourism

Rohan David Fernandez¹

¹Department of Humanities, Institute of Engineering & Technology, Srinivas University, Mukka, Mangalore-574146

Abstract: Online social websites have achieved a phenomenal global growth over the last decade. Not to be outdone, today we are living in an age where social media is not only relegated to the computer, but also the mobile phone. The proliferation of 'Smart phones' has kicked off debates about its use. It is a known fact that young adults and teenagers are the most avid users of websites. The millennials have good jobs which offer them generous salaries and the trend of travelling is catching up. Both inbound and outbound tourism has seen a leap in volumes. We are seeing destination weddings of celebrities, honeymooning to exotic locales and with an intent to copy them, many tourists want to do the same. We are bombarded on all sides by various social media sites and software; all with the same intent – to keep people in touch with others over distance. Findings of several research studies in the Online Social Networks (OSNs) area, has shown that these OSN sites have a great impact on the decisions made by tourists. It is critical to encourage and increase the visibility of the property through various mediums in order to capture the growing market. However hard we try, it is impossible to get away from the clutches of social media. This paper attempts to trace the impact of social media on the tourism industry in India. It also tries to put forth the common social media tools and how marketing strategies are evolving to capture the growing market in India.

Keywords: social media, tourism, tourist, marketing, communication

ID-46: Engineering of Nanomaterials for Electrochemical Water splittingD. H. Nagaraju¹¹Department of Chemistry, REVA University, Bangalore 560064, India

Abstract: Increasing demand for ecofriendly energy is an urgent requirement to solve biggest global threats like climate change and global warming. To solve this serious threat facing by human kind electrochemical water splitting is a novel approach to get 99.99% clean and green hydrogen, oxygen, which is sustainable and easy to carry out. 4d-block transition elements like Mo, Ru, Rh, Pd were also shows excellent catalytic activities due their structure and doping. On the other hand, 3d-ransition elements particularly which are relatively cheap like Ni, Co, Fe, Cu also displays good catalytic activity. Engineering of these transition metals with chalcogenides, hydroxides and phosphides with selective doping with each other are having the potential to replace the ideal and costly metal like Pt. In these material combinational trails Iron effect plays an important role when it is mixed hydroxides and chalcogenides of Ni and Co with quite high stability and better activity. The different phases of MoS₂, MoSe₂ and MoTe₂ were also the potential competitors in providing good activity. Herein, we have discussed the compositional, morphological and phase engineering of different materials and its relevance in highly demanding electrochemical water splitting. In designing the material composition for water splitting, it important to know and analyze the important parameters and their valuable input in understanding the requirements for better activity has been discussed in this work. The aim herein is to provide insights gathered in the process of studying, and describe valuable guidelines for engineering other kinds of nanomaterial catalysts for energy conversion technologies.

Keywords: catalytic activity, water splitting, nanomaterial catalysts, energy conversion technologies.

ID-47: Nanorings-The non-volatile RAM

Varsha Gangadhar Bangera¹

¹Dept. of CSE, Srinivas University Institute of Engineering and Technology, Mukka, Mangalore

Abstract: Magnetic random-access memories (MRAMs) are not new but could change our connection with the computer. In particular, with these memories, the computer system would not lose data in case of a power outage; it would be faster and consume less energy. Today these memories are still expensive and not totally reliable. The current challenge in the swift moving it world is to design a fast, reliable, inexpensive way of building a stable and nonvolatile memory. This technology to everybody's amazement is only a coin-sized hard drive that could store 100 or more movies and could work five hundred times faster than the present-day ram. These nanorings can store a great quantity of information. They also are immune to the problem of magnetic fields, which are fields that leak from other kinds of magnets and can thus interfere. It consumes 99 percent less energy than a normal ram does. While talking about the data security unlike most magnets, the rings keep the flux to themselves. This minimizes crosstalk and reduces error during data processing. Today's ram is fast, enabling your computer to make quick changes to whatever is stored there, but its chief drawback is its volatility it cannot perform without continuous unsaved document when their computer suddenly crashes or loses power, causing all the data stored in ram to vanish. This recent nanotechnology research is for sure to pave the way towards faster computer memories and higher density magnetic data storage all with an affordable price tag, the nonvolatile memory based on nanorings, with magnets next to them.

Keywords: Random Access Memory, nanorings, nonvolatile memory, storage capacity

ID-48: Synthesis of boron doped gC_3N_4

Kumari Sinki Puri¹

¹Dept. of Chemistry, Srinivas University Institute of Engineering and Technology, Mukka, Mangalore

Abstract: Polymeric graphitic carbon nitride (g-C₃N₄), a typical two-dimensional nanomaterial, has emerged as a popular candidate material for functional membranes because of its customizable structure and appealing physicochemical properties. In this work, we prepared boron-doped graphitic carbon nitride (B-g-C₃N₄) nanosheets by calcination method. B-g-C₃N₄ nanosheets were blended with polysulfone (PSf) casting solution to form low-pressure tight ultrafiltration mixed matrix membrane (MMM) using a nonsolvent induced phase inversion method. The prepared materials were characterized using SEM, AFM, XRD, IR, UV visible spectroscopy, water contact angle and water sorption to ascertain their morphological, chemical, wettability, surface and porosity measurements. B-g-C₃N₄ incorporated polysulfone mixed matrix membrane showed better metal ion rejection performance than the pristine polysulfone membrane. Overall, the enhancement in hydrophilic properties and reduction in fouling propensity of the fabricated MMMs confirms that the modified membranes have a potential to be used for water purification.

Keywords: B-g-C₃N₄, Nanosheets, Polysulfone, Mixed Matrix Membrane.

ID-49: Characteristics of Nickel- Molybdenum Disulphide composite coating- A Review

Varadaraj S¹, Atish S Benade¹, Akshay Sangappa¹, Vishwaj Gouroji¹, Shri Krishna Bhat¹, Prajwal¹

¹Dept. of Mechanical Engineering, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

Abstract: Mild steel is prone to corrosion as it is not an alloying element. There is a need for better protection in terms of protective coating. Molybdenum Disulphide is more corrosion resistant than nickel. Therefore, the Nickel-Molybdenum Disulphide is a better corrosion resistant coating. The paper exhibits the properties of Nickel – Molybdenum Disulphide composite coating. Molybdenum Disulphide has the capacity of hydrogen evolution. The thrust to carry out further research on mechanical properties of the coating is highlighted.

Keywords: Nickel, Molybdenum Disulphide, Mechanical Properties.

ID-50: Characteristics of Nickel- Titanium Carbide coating- A Review

Varadaraj S¹, Gangadhar Hosamani¹, Dhanush R¹, Charan M K¹, Rajath V Amin¹

¹Dept. of Mechanical Engineering, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

Abstract: The need for products with better surface protection is one of the criteria for improvement in product quality. Mild steel is prone to corrosion as it is not an alloying element. There is a need for better protection in terms of resistance to corrosion and mechanical wear. Titanium carbide is known for its rich mechanical properties. The extensive review on the existing works of Nickel-Titanium carbide composite coating has been reviewed in this paper. The thrust to carry out further research on exploring the properties of the coating is highlighted.

Keywords: Nickel, Titanium carbide, Surface protection.

ID-51: Exploration of the properties of electrodeposited Nickel-Graphene coating on Mild steel.

Varadaraj S.¹, Shreeprakash B.¹, Praveen B. M.², Bharath K. Devendra³

¹Dept. of Mechanical Engineering, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

²Department of Chemistry, Srinivas University, Institute of Engineering & Technology, Mukka, Srinivas Nagar, Mangaluru - 574146, India.

³Department of Chemistry, M. S. Ramaiah College of Arts, Science and Commerce, MSRT Post, MSR Nagar, Bengaluru - 560 054, India.

Abstract: Environmental protection of metallic components has long been a top priority for the engineering and manufacturing industries. Coating technology has grown in popularity in response to industrial demands. The coating is used to protect the metals and ensure the product's performance for a long time. The electrodeposition process has proven to be the most cost-effective and simple among other coating processes such as thermal spray, spark plasma sintering, and chemical vapour deposition. The paper discusses the properties of various Nickel-Graphene composite electrodeposited Protective coatings.

Keywords: Nickel, Graphene, Corrosion resistance, Hardness.

ID-52: Impact of cybercrime in the Indian banking sector and measures to be taken to avoid cybercrime by fraudulents

Veeranna Kotagi¹, Naveen Kumar J. R.²

¹Dept. of CSE, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

²Dept. of ECE, AIML, NT, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

Abstract: The Indian banking industry is old and many changes are brought in this industry since liberalization. It involves moral practice, financial distress and company governance. But due most of the banking transactions are done online nowadays which made life easier, at the same time cyber-crimes have increased rapidly. So, there is urgent need to take tough security measures to avoid the cyber-crimes in banking system. The research in this paper found out how the fraudulents do the cyber-crimes in the banking system and some measures are suggested to avoid these cybercrimes.

Keywords: Cyber-crime, Banking system, Fraudulents.

ID-53: Significance of artificial intelligence in healthcare system in India

Veeranna Kotagi¹, Naveen Kumar J. R.²

¹Dept. of CSE, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

²Dept. of ECE, AIML, NT, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

Abstract: India is a country having huge population. Hence it is a difficult task to setup a healthcare system in a country like India in traditional way. Hence government has to adapt the new technologies to balance the need of healthcare along with its traditional system. So artificial intelligence plays a huge role in balancing the healthcare system in country like India. So, in this paper it is suggested how artificial intelligence can be used to balance and make efficient healthcare system.

Keywords: Artificial intelligence, Healthcare system.

ID-54: A study on impact of defects in requirements collection in software development life cycle

Veeranna Kotagi¹, Naveen Kumar J. R.²

¹Dept. of CSE, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

²Dept. of ECE, AIML, NT, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

Abstract: The requirements collection is one of the important stages in software development. So, it is very important to collect the proper requirements from the customers which can be satisfied. But sometimes it happens that there will be some defects in the requirements collected from the customers which lead to the development of the software which gives the wrong results. Hence it is important to study the requirements collected and analyze them to identify the defects in it. So, in this paper it is suggested the different ways to do the study and analyze the requirements collected and remove those defects using different methods.

Keywords: Defects, requirements, measurement.

ID-55: An empirical study of defect identification in software development to improve the quality of software product

Veeranna Kotagi¹, Naveen Kumar J. R.²

¹Dept. of CSE, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

²Dept. of ECE, AIML, NT, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

Abstract: Software requirements defects are highly-priced and time consuming. The price of locating and correcting defects represents one of the maximum highly-priced software program improvement activities. And that too, if the mistakes get over excited until the very last attractiveness checking out level of the undertaking existence cycle, then the undertaking is at a more hazard in phrases of its Time and Cost factors. A small quantity of attempt spent on pleasant warranty will see proper quantity of price financial savings in phrases of detecting and getting rid of the defects. To benefit a deeper knowledge of the effectiveness of the software program system, it's far critical to look at the information of defects detected within side the beyond initiatives and to look at how the equal may be removed because of system enhancements and more modern methodologies. This paper will recognition on locating the entire variety of defects that has come about within side the software program improvement system for 5 comparable initiatives and ambitions at classifying numerous defects the usage of first stage of Orthogonal Defect Classification (ODC), locating root reasons of the defects and use the gaining knowledge of the initiatives as preventive thoughts. The paper additionally showcases on how the preventive thoughts are applied in a brand-new set of defects in requirements.

Keywords: Defects, Orthogonal Defect Classification, Prevention.

ID-56: Polyethylenimine-cerium oxide-reduced graphene oxide nanocomposite for CO₂ sensing application

Naveen Kumar J. R.¹, Veeranna Kotagi²

¹Dept. of ECE, AIML, NT, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

²Dept. of CSE, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

Abstract: This work deals with materials, methods, experimental procedure, characterization and results and discussions related to polyethylenimine-cerium oxide-reduced graphene oxide nanocomposite for CO₂ sensing application followed by analysis and correlation of the sensitivity properties for various formulations with the analysis results. The reason for the difference in sensitivity behaviour of samples with 0.25, 0.50, 0.75, and 1.00 wt % of cerium oxide (CeO₂) and reduced graphene oxide (rGO) in polyethylenimine (PEI) coated on the interdigitated electrode (IDE) prepared from copper-clad is discussed. Further, the variation in resistance vs gas concentration, repeatability, response time and recovery time is narrated

Keywords: CO₂, cerium oxide, rGO, PEI, IDE.

ID-57: Polyethylenimine-chromium oxide-reduced graphene oxide nanocomposite for CO₂ sensing application

Naveen Kumar J. R.¹, Veeranna Kotagi²

¹Dept. of ECE, AIML, NT, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

²Dept. of CSE, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

Abstract: This work deals with materials, methods, experimental procedure, characterization and results and discussion related to polyethylenimine-chromium oxide- reduced graphene oxide nanocomposite for CO₂ sensing application followed by analysis and correlation of the sensitivity properties for various formulations with the analysis results. The reason for the difference in sensitivity behaviour of samples with 0.25, 0.50, 0.75, and 1.00 wt % of chromium oxide (Cr₂O₃) and reduced graphene oxide (rGO) in polyethylenimine (PEI) coated on an interdigitated electrode (IDE) prepared from copper-clad is discussed. Further, the variation in resistance vs gas concentration, repeatability, response time and recovery time is narrated.

Keywords: CO₂, chromium oxide, rGO, PEI, IDE.

ID-58: Optical limiting application of cerium oxide/polycarbonate nanocomposite for comfortable night time driving

Navaneeth Gowda N.¹, H. V. Rohith¹, Abhishek¹, Ajin Saji¹, Naveen Kumar J. R.^{2*}, Lokesh K. S.¹

¹Department of Nano Technology, Srinivas Institute of Technology, Mangaluru, Karnataka, India

²Dept. of ECE, AIML, NT, Institute of Engineering and Technology, Srinivas University, Mukka, Mangalore

Abstract – The synthesized particles are found to be in the range of 40 to 60 nm. Polycarbonate is dissolved in chloroform and mixed with cerium oxide nanoparticles. The nanoparticles are dispersed using ultrasonication. The ratio is varied from 0.25, 0.5, 0.75 and 1 wt%. The obtained dispersion is coated on a polycarbonate sheet using drop casting. In this work, the optical limiting effect of cerium oxide/ polycarbonate nanocomposite is examined. The cerium oxide nanoparticles are synthesized using co-precipitation method. The absorptive characteristics are studied using luminous intensity (lux) meter and UV-Vis Spectrometer and compared to the plain sample.

Keywords: Optical limiting effect, Co-precipitation, Luminous intensity.

ID-59: ZnO nanoparticles based triboelectric nano generator for charging portable electronic gadgets

Shweta Varute¹, Mayur Kumar¹, Aliya Farook B.¹, Kuchanur Meghana B.¹, Shareefraza J. Ukkund^{1,2*}

¹Department of Nano Technology, Srinivas Institute of Technology, Mangalore - 574143, India

²Department of Nano Science & Technology, Institute of Engineering and Technology, Srinivas University

Abstract – Triboelectric Nanogenerator (TENG) has been introduced recently as a novel, robust, and versatile technique for mechanical sensing system as well as harvesting mechanical energy to power electronics. TENG can be used for harvesting energy from different sources such as human activities, wind and water motion, and structural vibration. TENG operates based on the mechanism of contact electrification and electrostatic induction between two dissimilar thin film materials with very different electron affinity. In this experiment we fabricate a triboelectric nanogenerator which comprises of Polytetrafluoroethylene (PTFE), paper, Zinc Oxide (ZnO). This ZnO based TENG can be useful for charging portable electronic gadgets anytime and anywhere.

Keywords: Triboelectric Nanogenerator (TENG), Polytetrafluoroethylene (PTFE), Zinc Oxide (ZnO).

ID-60: A review on the draw-backs of nanosized electronic components, and their solution with spintronics

Sudhanva Narayana K. S.¹, Prasad P.^{1,2*}, Savitha M. B.³

¹Department of Nanotechnology, Srinivas Institute of Technology, Mangaluru, Karnataka.

²Centre for Nano Science and Technology, College of Engineering and Technology, Srinivas University, Mukka, Karnataka.

³Department of Chemistry and Research Centre, Sahyadri College of Engineering and Management, Adyar, Mangaluru, Karnataka, India

Abstract – Spintronics is a promising technology that aims to solve the major problems existing in today's conventional nanosize electronic devices. Realistically, this technology can combine the main functions of the modern semiconductor nanoelectronics and magnetic storage devices in a single chip. Electrons have two fundamental degrees of freedom called charge and spin. Conventional nano electronic devices used only the charge of electrons for information processing using binary bits 0 and 1. The continuous developments in conventional nano electronics are depending on reducing the size of integrated circuits by reducing the size of components like transistors, and capacitors for their applications in random access memory, microprocessor, etc. The main aim of this work is to give a simple and clear picture to researchers who are beginners of research in this field. The present work reviews the history and development of memory devices. It also includes the present developments in spintronics beginning with different types of spin-valve devices, their working principle, about conventional MTJs along with recently developed different types of MTJ devices such as DI-MTJ and DMTJ. The review also describes the main characteristics of spintronic devices such as GMR and TMR effects along with different parameters that influence these effects and various writing techniques adapted for MTJs such as FIMS, TAS, and STT.

Keywords: Semiconductor, Memory devices, CMOS, Spintronics, Spin valve & MTJ.

ID-61: Extraction and characterization of nano-hydroxyapatite from sea-shell and their application in pest control

Ashwathi V. Nair¹, Geetha B.¹, Shanmukha Gowda G. S.¹, Abhinaya N.¹, Shareefraza J. Ukkund^{1,2*}

¹Department of Nano Technology, Srinivas Institute of Technology, Valachil, Mangalore, India

²Department of Nano Science & Technology, Institute of Engineering and Technology, Srinivas University

Abstract – In this study we focused on a simple and low-cost method for the extraction of nano-hydroxyapatite from sea shells. Nano-hydroxyapatite (nHAp), $[\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2]$ is the main inorganic component of sea shell and is widely used in various applications due to its excellent property. The obtained nHAp is characterized by Scanning Electron Microscope (SEM), Transmission Electron Microscopy (TEM) and Fourier-transform infrared spectroscopy (FTIR). By aggregating nano-hydroxyapatite (nHAp) and a soluble Cu (II) compounds with nitrogen stabilizer shows promising results in the control of the pathogen called *Plasmopara viticola*, which is considered to be the most devastating disease of *Vitis vinifera* (Grape vine). It confirms the potential role of nHAp as an innovative delivery system of Cu (II) ions. In addition to nHAp and Cu (II) compounds, nitrogen stabilizer is used to maintain the stability of the crops. The present work indicates the possibility of improving the biological activity of a bioactive substance by modifying its structure through an achievable formulation with a naturally extracted material.

Keywords: Pest, Pesticide, Sea shell, Nano-hydroxyapatite (nHAp), Copper (II) compounds, Nitrogen stabilizer, *Plasmopara viticola*, *Vitis vinifera* (Grape vine).

ID-62: Two new methods for the synthesis of low-resistance carbon with possible potential applications in supercapacitors: Flash pyrolysis in a domestic microwave oven and fast pyrolysis in a muffle furnace in lab generated inert atmospheres using dried green leaves from banana plants as raw materials

Shubha B. S¹, Dhanya², Greeshma², Shraddha², Anuradha², Ashwini Kumari², Spoorthi², Bharath³, Sumanth G⁴, Chithaiah P⁵, Praveen B M⁶, V. Bhat⁶

^{1,2,3,4,5}Department of Chemistry, Shankar First grade college, Udupi

⁶Department of Chemistry, Institute of Engineering and Technology, Srinivas University

Abstract – We have prepared low- resistivity carbon by using two new methods: Flash pyrolysis and fast pyrolysis. Flash pyrolysis is a method in which stacks of banana leaves were bombarded with microwaves using a domestic microwave oven. The time taken for the synthesis of such carbon is in the range of 7 to 120 seconds. The resistivity observed in this method is roughly in the range of x to $y \Omega \text{ cm}$. In the second method, pyrolysis is carried out in a preheated muffle furnace, in a locally generated inert atmosphere, for duration ranging from 10 minutes to 2 hours. Carbon materials exhibit low resistivity as inferred by measurement of resistance using ordinary multimeter and comparing the resistance values with such measurements on crystalline graphite powder. Microwave assisted synthesis gives a small quantity (a few hundred mg) of carbon within a short duration - as low as 10 s. On the other hand, fast pyrolysis can be used to synthesize gram quantities of carbon by high temperature (700-850 °C) treatment for just 10 to 120 min. We have carried out thermogravimetric analysis for sun dried banana leaves in Nitrogen atmosphere. Thermogravimetric analysis (up to 250 °C) in air, for oven- dried samples, powder X-ray diffraction analysis for a sample of carbon material obtained through flash pyrolysis method.

Keywords: low-resistance carbon, supercapacitors, carbon material.

ID-63: Bidimensional Empirical Mode Decomposition based Dimensionality reduction for Object Detection Using Alexnet Architecture

Anvar Shathik J¹. and Veerabhadra Babu¹

¹Department of CSE, Institute of Engineering and Technology, Srinivas University

Abstract – Object detection is among the most significant and widely used methods for identifying target items in a specific image and determining their position and category in order to understand machine vision. Object detection plays a significant major in Computer Vision (CV) research, theory, study and practical application. Machine learning has been the primary source of object detection techniques before the existence of Deep Learning algorithms to detect object. Object identification is one among the major areas of Computer Vision (CV) has made considerable strides. Real-world items like as human faces, animals, and cars may be found in photographs and movies using object detection. Learning techniques and extracted characteristics are used in an object identification algorithms to identify the objects in an image. The image identification algorithms have achieved the incredible performance because to considerable advancements in neural networks, particularly deep learning. Finally, a visualization of images from the COCO dataset that offers a side-by-side comparison with current approaches and is located on the "optimal front" of the speed versus accuracy plot. The findings were compared against modern techniques in a variety of performance measures, with a focus on the speed and accuracy of current object detection methods.

Keywords: Deep Learning algorithms, COCO dataset, current object detection.

ID-64: Characterization and Mechanical Studies of Reduced Graphene Oxide Filled E-Glass Reinforced with Epoxy Nano Composites

Ananya Bhat¹, Puneet.S.¹, Raghavendra B.M.¹

¹Srinivas Institute of Technology, Valachil, Mangalore - 574143

Abstract – In the present study Reduced graphene oxide nano particles were synthesized by modified hummers method. UV-VIS spectroscopy is carried out to confirm that synthesized rGO particles reduced to nano size. Energy dispersive X-ray analysis and scanning electronic microscopy were conducted to analyze the surface morphology of the synthesized rGO nano particles. Synthesized rGO nano particles were filled with different weight percentage of epoxy matrix which is reinforced with e-glass fibers by manual layup method. Testing of synthesized nano fiber plastics has been done according to ASTM standards to evaluate mechanical behavior. In tensile loading sample containing 0.5% of rGO yield higher stiffness compared to other results. The sample containing 0.75wt % of rGO has a maximum load 6.08% more than that neat samples. In flexural loading sample containing 1wt % rGO has maximum force capacity 6% more than that of pure samples Flexural modulus is found to be high in sample containing 0.5wt % rGO. In impact loading sample containing 1wt % rGO yield higher strength compared to another sample.

Keywords: rGo Nano composites, mechanical Studies, GFRP composites.

ID-65: Impact of fibre orientation on mechanical properties of GFRP composites

Varuna T.¹, Sangam Baskar Devadiga¹, Laxmi Ishappa Itagi¹, Suma K. S.¹

¹Department of Aeronautical Engineering, Srinivas Institute of Technology, Valachil, Mangalore - 574143

Abstract – Knowing the characteristics of a composite material under a given set of circumstances is essential for reliable structural member design. Understanding and being familiar with the stacking order of laminates organised to make a composite is essential since composites are used in an increasing number of applications. The goal of the current effort is to create an E-glass fibre reinforced with epoxy composite by rotating the laminates to 0°, 45°, and 90° and integrating all three orientations manually. Different samples were compared experimentally while being compressed and tensioned. The specimen with a 0° orientation in the tensile test demonstrated outstanding resistance to tensile loading. Additionally, various combinations of fibre orientations produced higher compression resistance than other specimens, and it had a maximum tensile strength of 395 Mpa.

Keywords: Fibre orientation, mechanical properties, GFRP structures.

ID-66: Synthesis of Graphite Nano Particles for Developing PVA based Nano Composites

Yashwanth H. L.¹, Channa Keshava Reddy K. L.¹, Sharanya I. S.¹, Hrithika Nikam¹

¹Department of Aeronautical Engineering, Srinivas Institute of Technology, Valachil, Mangalore - 574143

Abstract – The present work aims to develop Graphite Nano Particles (GNP's) based Poly Vinyl Alcohol (PVA) nano composites. Cold water soluble PVA is used in the present study which is blended fractionally with synthesized graphite nanoparticles in the ratio of 0.25, 05, 0.75 and 1% by weight by open mold method followed by autoclave curing to ensure proper curing of prepared samples. The synthesized graphite nanoparticles were subjected to UV-vis spectroscopy analysis, where in the highest peak was observed at 255nm.

Keywords: GNP's, PVA nano composites, UV-vis spectroscopy.

ID-67: Measuring Sensitivity of Conducting Nano-composites of Polyaniline / Tin dioxide Thin Films for Carbon dioxide Gas SensorS. H. Nimkar^{1*}, S. B. Kondawar², P. A. Fartode¹¹Department of Physics, Shri Shivaji Arts Commerce and Science College Akot (MH), 444101 (India)²Department of Physics, Polymer Nanotech Laboratory, RTM Nagpur University, Nagpur-440033 (India)

Abstract – The continuous exposure to CO₂ gas in confined areas can be potentially lethal for human health. It also acts as an oxygen displacer in limited area and causes several health issues; sometimes responsible for death. Hence timely detection of high concentration of CO₂ gas in affected areas is necessary. The nanocomposites thin film of Polyaniline/Tin dioxide-based sensors synthesized by solution route technique will help to monitor carbon dioxide (CO₂) gas at normal temperature. The different molar concentration of nanocomposites has been deposited through solution route technique on simple glass substrate with using hydrogen peroxide and ammonium persulphate in acidic medium. The practical examination to achieve the objectives was studied by routine methods like XRD, FTIR, UV-Visible Spectra and SEM. These characteristics measured through the formation of nanocomposites and growing of PANI on SnO₂ nanoparticle surfaces. The FTIR and UV-Visible spectra confirmed that Polyaniline undergoes through an electronic structure modification as a result of interaction between SnO₂ nanoparticles with polyaniline. About 1000 ppm of carbon dioxide gas in air at room temperature was exposed to thin film of nanocomposites having different molar concentration. The resistance of Polyaniline/Tin dioxide nanocomposites thin films goes on increasing from the respective unexposed value which specify that thin film reacted toward CO₂ gas. The response time of ~25 seconds was observed and recovery time was lies between 90-100 seconds on exposure of clean air into a chamber repeatedly.

Keywords: CO₂ gas sensor, Conducting polymer, Polyaniline (PANI), Tin dioxide (SnO₂).

ID-68: Anticorrosive property of a green and sustainable inhibitor from leaves extract of *Tabebuia heterophylla* plant: Chemical, Electrochemical and Surface Analysis Approach.

Geeta.D.Pai^{1*}, Rajappa S. K.¹

¹Department of Chemistry, Karnatak Science College, Dharwad-580 001, India

Abstract – The corrosion inhibition action of *Tabebuia heterophylla* leaves extract (THLE) were tested on low carbon steel in 1M Hydrochloric acid by weight-loss and electrochemical methods at $300 \pm 1K$. The weight loss result indicated, as increases the concentration of THLE, the corrosion rate found to be decrease and inhibition efficiency increases and shown 98.4% I.E. at 4.4ml(g/L) optimum concentration. Tafel polarization measurements showed that, the inhibitor were exhibited as mixed type (cathodic / anodic) inhibitors. Further, the corrosion control of MS in presence of inhibitors could evaluate through adsorption phenomenon and fitted to Langmuir's adsorption isotherm. The change in surface morphology of mild steel and chemical interactions of inhibitor molecules on specimen surface were evaluated through FT-IR, Scanning electron microscopic linked with EDX, UV-visible spectrophotometer, Atomic force spectroscopy and Contact angle techniques. The results supported that, the THLE creates a passive protective layer through adsorption on low carbon steel and thereby reduces corrosion.

Keywords: *Tabebuia heterophylla*, low carbon steel, optimum concentration.

ID-69: Some Realizable and nonrealizable Lattice of Trail Sets of a Connected Graph

Asha Saraswathi B.¹

¹Department of Mathematics, Srinivas University Institute of Engineering & Technology, Mukka, Mangaluru

Abstract – It is known that the set of all Trail sets of a finite connected graph G , denoted by $\tau(G)$, together with empty set partially ordered by set inclusion relation forms a lattice. . In this paper some realizable and nonrealizable lattice of Trail sets of a connected graph is discussed.

Keywords: Connected Graph, Lattice, Chain, Atom.

ID-70: Fuzzy based high performance machine learning approach for the selection of bio-resourceNookala Venu¹¹Department of Electronics and Communication Engineering, Balaji Institute of Technology and Science, Narsampet, Warangal-506331, Telangana

Abstract – Biomass is a renewable and sustainable green energy material. It is made up of lignin, cellulose, and hemicellulose with considerable amount of water, extractives, and inorganic chemical compounds. The use of biomass materials and other biogenic wastes for energy recovery represents an eco-friendly way. Biomass material selection is one of the most significant aspects for any energy conversion process, and it is a common outsourcing problem that includes material preparation, reactor performance, economic assessment, and calorific value of the products. Fuzzy systems can be quite useful in high-performance computing during the selection of biomass materials. In each engineering process, material selection is a crucial step since each material is having its own set of characteristics. This study presents the application of type-1 fuzzy set for the selection of suitable biomass material for yielding maximum bio-oil. This study focuses on seven locally available materials such as rice straw (M-1), sunflower shell (M-2), hardwood (M-3), wheat straw (M-4), sugarcane bagasse (M-5), corn cop (M-6), and palm shell (M-7). The study evaluated seven important properties of the materials such as lignin (P-1), cellulose (P-2), hemicellulose (P-3), volatile matter (P-4), fixed carbon (P-5), moisture content (P-6), and ash content (P-7). The findings demonstrated that sugarcane bagasse (M-5) is the best option for maximum bio-oil yield. Furthermore, the potential of nanoscale catalysts in improving the yield of bio-oil through real-time experiments was studied. The findings of this work add to our understanding of the application of fuzzy-based systems for energy applications.

Keywords: Fuzzy Systems, Bio-Oil, Sugarcane Bagasse, Nanoscale Catalysts.

ID-71: Hand Grip Strength and Muscle Endurance Time in Vegetarian and Non-Vegetarian Adolescents A Comparison

Pavanakrishnamoorthy¹, ChaitraUppangala¹

¹Department of Physiology, Srinivas Institute of Allied health Sciences, Mukka, Mangalore.

Abstract –In terms of food consumption, vegetarian and non-vegetarian diets have different nutritional contents resulting in a potential variation in body composition and strength traits. The present study was conducted to compare the hand grip strength and endurance time in vegetarians (V group) and non- vegetarians (NV group) adolescents. Methods: Anthropometrically matched 40 vegetarians and 40 non- vegetarians in the age group 18-20 years were recruited for the study. Based on dietary intake on self-reported dietary habits the participants were divided into vegetarian (V) and non vegetarian (NV) categories. The dietary data was collected using Dietary Recall Method. Measurement of Handgrip Strength was done using a handgrip dynamometer following standard methods. HGS max in kg and endurance time (ET) in seconds were recorded. Result: Our study shows that the hand grip strength in ‘V’ group was 25.73 ± 6.3 and in ‘NV’ group was 25.6 ± 6.19 , P-value is 0.92 and muscle endurance ‘V’ group was 43.1 ± 20.07 and in ‘NV’ group was 42.2 ± 26.5 , P-value is 0.86. There is no significant relation on hand grip strength and muscle endurance between vegetarians and non- vegetarians adolescents are observed in this study. We can draw the conclusion that a well-planned and balanced vegetarian diet is just as nutrient-dense for excellent bone and muscle growth as a non-vegetarian diet. Additionally, maintaining a high level of performance requires appropriate nutritional diet.

Keywords: Potential Variation, Adolescents, Dietary Recall Method, Handgrip, Dynamometer.

ID-72: A Review on Prevalence of Dental Fluorosis in India

Mallikarjun¹ , Santhebennur Jayappa Veeresh^{2*}

¹Department of Chemistry, Srinivasa University, Institute of Engineering and Technology, Mukka-574146, Mangaluru, Karnataka, India

²Department of Studies in Food Technology and Environmental Science, Davangere Univeristy, Davanagere- 577007, Karnataka, India

Abstract – In Indian geographical structure, fluoride bearing minerals are found in more than fifty percent of the states. Hence fluoride contamination of drinking water is also prevalent. Consumption of fluoride containing water and other sources can lead to human health effects. The major health effect caused by the intoxication of fluoride is dental Fluorosis. This review article gives insight into the prevalence rate of dental Fluorosis cases across India. The results reveal that, in all the studies dental Fluorosis is more than thirty percent to sixty nine percent of the sampled population. Fluoride is good or bad for human health is still the discussion point. Very intense research is undertaken by a number of scientists but still there is no clarity on whether fluoride is boon or bane. However, day by day increasing Fluorosis cases in India and good mitigation programmes are also implemented by the government but it is very difficult to stop the intake of fluoride by human beings.

Keywords: Dental fluorosis, Drinking water, Human health, Minerals.

ID-73: Microwave assisted one pot green synthesis of 2,4,5- trisubstituted imidazole derivatives using nickel ferrite as an efficient catalystChandrashekhar A. Ladole^{1*}¹Shri Shivaji Arts, Commerce & Science College, Akot, Maharashtra state – 444101

Abstract – A convenient and efficient environmentally benign protocol for the synthesis of 2,4,5-trisubstituted Imidazole Derivatives derivatives in moderate to high yields via one-pot three component reaction of aldehyde (1 mmol), benzyl (1mmol), ammonium acetate (2 mmol) and Nickel ferrite were placed in 50 mL in RBF and place in microwave for required time. Reaction was monitored by using TLC. This protocol offers several advantages of its greenness with respect to mild reaction conditions, good performance, operational simplicity and short time reaction and easy work-up procedure. After completion of reaction, mixture was diluted with chloroform (12 mL) and reaction mass was stirred. The slurry was filtered to remove the catalyst and washed with chloroform (4×5mL). Combined filtrate was evaporating on rotary-evaporator to obtain a solid residue. The solid residue was stirred in water than filtered and recrystallized from ethanol to give pure product. The synthesized products were confirmed using FT-IR, ¹H; ¹³C NMR spectroscopic data and melting points compared with reported values.

Keywords: Imidazole Derivatives, Operational Simplicity, Rotary-Evaporator, Solid Residue.

ID-74: Inhibitory efficacy of bioactive Compounds extracted from Areca catechu L. nut on Matrix Metalloproteinases an In-Silico study

Ajesh Kumar A^{1*}

¹Chemistry, Jamal Mohamed College, Tiruchirappalli, Tamilnadu

Abstract – Arecoline is a nicotinic acid-based mild parasympathomimetic stimulant alkaloid and Nonanaldehyde or Nonanal is well known for its fragrance property (in the form of nonanoic acid), found in Areca catechu L. nut. Matrix Metalloproteinase (MMPs) 2 and 9 bound with Arecoline with a binding score of -5.9 and -4.3 respectively and that of nonanaldehyde, -5.3 and -3.9. Arecoline has more significant effect with MMP 9 than MMP 2 and nonanaldehyde also has more significant effect with MMP 9 than MMP 2. The effect of Arecoline and nonanaldehyde against matrix metalloproteinase (MMPs) 2 and 9 to investigate its biological properties through systems biology based approach. Arecoline and nonanaldehyde are capable of inhibiting MMP 9 and MMP 2 in a significant level. Corneal healing may be due to the presence of arecoline and nonanoic acid found in Areca catechu L. nut. This may lead to various studies related with eye disorders.

Keywords: Metalloproteinase, Arecoline, Nonanaldehyde, Corneal healing, Areca catechu L. nut.

ID-75: Development of Some Fine Chemicals as Advanced Key Intermediates having Industrial Applications

Jidugu P.¹, Rajkumar G.¹, PogulaV.¹, & Nagaraja T. R.¹, Singh R. V.¹

¹R&D & Custom Synthesis, Merck Life Science., Plot #12, BommasandraJigani link road, Bangalore.

Abstract – Assurance of Supply and Regulatory Compliance is one of the most important criteria. Typically, we are able to guarantee that goods and services are regulatory compliant, have the ability to ramp up or down their capacity to meet company demands, can produce the quantities required, and complies to all applicable shipping, environmental and safety regulations. In the Quality criterion, we are having the ability to provide goods and processes which meet required specifications. We have strong process development and analytical capabilities in order to develop chemistry and analytical methods which are essential to support early API Industries.

Keywords: Regulatory Compliance, Quality Criterion, API Industries

ID-76: Preparation and characterization of reduced graphene /copper oxide nanocomposite thin films for solar thermal application

N. Murugesan¹, S.A.Sethu Raaman², P.Indira³, S. Karthick Kumar³, M.Sivabharathy³

¹Department of Physics, Bharath Niketan Engineering College, Aundipatty, Theni, Tamil Nadu, India

²Department of Mechanical Engineering, Sethu Institute of Technology, Kariapatti, Tamil Nadu, India

³Department of Physics, Sethu Institute of Technology, Kariapatti, Virudhunagar, Tamil Nadu, India

Abstract – Graphene Oxide (GO) modified copper oxide (CuO) on aluminum (Al) substrates were prepared using dip-coating method at different weight percentage of GO. The surface structural analyses and morphology of the rGO-CuO coatings were carried out by X-ray diffraction (XRD), energy dispersive spectroscopy (EDX) and scanning electron microscopy (SEM). XRD studies indicated the single phase nature and high crystalline of face centered cubic and monoclinic structures. The SEM images reveal that grain like morphology, which randomly distributed with rGO sheets. The solar absorptance and thermal emittance values of these prepared CuO and rGO-CuO thin film samples were evaluated. The observed solar selectivity values suggest that these prepared absorber coatings can be used as selective absorbers in solar thermal devices.

Keywords: Graphene nanocomposites, CuO-graphene nanocomposites.

Editorial Panel

CHIEF EDITORS



Dr. Praveen B. M.
Director
Research & Innovation Council
Srinivas University



Dr. Naveen Kumar J. R.
Assistant Professor
Department of ECE, AIML & NT
Institute of Engineering & Technology
Srinivas University

CO-EDITORS



Dr. Shubhrajyotsna Aithal
Associate Professor
Department of Chemistry
Institute of Engineering & Technology
Srinivas University



Dr. U. Sandhya Shenoy
DST-Inspire Fellow
Institute of Engineering & Technology
Srinivas University