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National Conference on
Environmental Pollution Monitoring and Remediation

NCEPMR – 2019

Organized by :

Department of Chemistry

VIKRAMA SIMHAPURI UNIVERSITY

Nellore – 524 324, Andhra Pradesh, INDIA

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About the Editor

Dr. Vijaya Yarramuthi obtained M.Sc. (2003), M.Phil. (2006) and Ph.D. (2009) in Chemistry from Sri Venkateswara University, Tirupati, Andhra Pradesh, India. Visiting Researcher at Research centre for Soil & Water Resources and Natural Disaster Prevention, National Yunlin University of Science & Technology, Taiwan (2019). Dr. Vijaya presently working as Associate Professor & Head in the Department of Chemistry, Vikrama Simhapuri University, Nellore, Andhra Pradesh, India. Her research interests are Adsorption Process in Water Treatment (Removal of metals, phenols, dyes and fluorides) and Design and synthesis of natural and synthetic adsorbents for water treatment. Dr. Vijaya published over 30 research papers with good impact factor and total citation index of **1767, h- index of 14, i-10 index of 16** in various top tired journals including Carbohydrate Polymer Journal, Bioresource Technology and Chemical Engineering Journal etc.

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Message

I am very happy that the Department of Chemistry, Vikrama Simhapuri University is organizing National Conference on Environmental Pollution Monitoring & Remediation during February 06-07, 2019. It gives me immense pleasure in inviting the scientific community from academic, industry and Research & Development institutes from different states of the Country.

Pollution is a phenomenon that destroys land, air, water bodies and buildings. Pollution is mainly chemical rather than physical as it changes the quality of atmosphere. Pollutants are trans boundary and travel thousands of miles from the place of origin. Organic pollutants are non biodegradable and resist degradation by microorganisms. Therefore, they accumulate in the ecosystems and stay for a long time. They distort the food chains leading to drastic changes in the bio-diversity and also destroy habitat.

Environmental monitoring is essential to gather information to assess the effectiveness of the environment. The Organizing Committee is successful in bringing together eminent speakers in different areas of Environmental Pollution Monitoring & Remediation from all over the country and look forward to fruitful deliberations. I am sure that the delegates will take the maximum advantage by interacting each other to maximize the outcome of the Conference.

I once again extend a warm welcome to all the invitees on behalf of Vikrama Simhapuri University and wish you all a cheerful stay and wonderful visit to our historical "Spiritual City".

With Best Wishes

Prof. R. Sudarsana Rao
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Message

Warm greetings and hearty welcome to all the enthusiastic delegates of NCEPMR – 2019. I feel proudly fortunate to be a part of this prestigious two day event which provides a unique opportunity for all the patrons of science to share, edify and disseminate expertise, knowledge and wisdom.

I am sure that the congregation of the delegates including teaches, research scholars and students will immediately benefit out of the fruitful deliberations carried out during the event.

Pollution is the introduction of contaminants into the natural environment that causes adverse affect. It can take the form of chemical substances (or) energy, such as noise, heat (or) light. Pollutants, the components of pollution, can be either foreign substances/energies (or) naturally occurring contaminants. Major current environmental issues may include climate change, environmental degradation and resource depletion etc. To understand the extent of pollution due to heavy metals and arrive at realistic assessment, frequent gathering, seminars and conferences provide good fora. These fora help exchanging ideas among experts and new comers, and know the current state of the art in the chosen subject. With this as the main objective, organizers planned a two day conference with environmental chemistry as the main theme.

On this occasion, I congratulate the delegates who have evinced keen interest in participating and sharing their expertise during this event.

I wish all the delegates and participants for stimulating the matter and getting learning experiences.

With Best Wishes

Prof. A. Durga Prasada Rao
Registrar
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04.02.2019

MESSAGE

I am extremely happy to learn that the Department of Chemistry, Vikrama Simhapuri University, Nellore, is organizing a National Conference on Environmental Pollution Monitoring and Remediation during 6th and 7th February 2019.

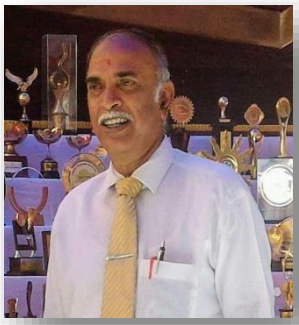
Environmental pollution world-wide has reached gargantuan proportions with the rapid degradation of natural resources, loss of bio-diversity, industrial and vehicular pollution, pollution of the marine environment and air, and the consequent climate change. It poses a big threat to the healthy existence of the humankind and other species. All over the world, Governments have been paying serious attention to continuously monitor and minimize pollution. Use and misuse of pharmaceuticals, pesticides, and petrochemicals are causing havoc with nature, as they persist as such or as their toxic metabolites in water and air. These pollutants bio-accumulate in the environment and they ultimately reach man through various means including the food cycle.

Concerns about this problem have triggered mechanisms of monitoring like environmental impact assessments, preparation of source inventories, environmental audits of industrial units, and development of indices and policy perspectives on the proper management of assessment. Studies on global warming, ozone depletion, acid rain, aerosols characterization, and such other factors have been carried out to study the trends and evolve strategies for action for the future. Environmental pollution detection is the first step in the monitoring process. Approaches involving bio-systems have more recently been in vogue for which plants, animals and micro-organisms are used. From the point of view of diagnostic, preventive and remedial measures bio-monitoring has become a useful device. Remediation measures, as we can see, involve the application of knowledge and technologies that are multidisciplinary, with Chemistry and the Biological Sciences playing an important role in mitigating human suffering.

I am quite sure that this Conference would give the impetus for exploring interdisciplinary areas of research among the Chemical and Biological Sciences Departments at Vikrama Simhapuri University leading to the evolution of processes that would mitigate the effects of environmental pollution and enhance the quality of life on the planet. I take this opportunity to congratulate Dr. Y Vijaya and Dr. T Veera Reddy and their colleagues of the Chemistry Department and offer my best wishes to them for the successful organization of the National Conference and also for launching on innovative models of monitoring and remediation.

C.R. Visweswara Rao

(C R VISWESWARA RAO)



Dr. A.V.R. Reddy

Sr. Scientist, BARC, Mumbai

Message

Environment, pollution, global warming, analysis and control are some of the oft used words not only by scientists, technologists and policy makers but also by general public. This is a reflection of increased awareness about various adverse effects that are being envisaged: some are real, some are exaggerated and some are unfounded. But reality is that a grave concern in the minds of the public "exists". Therefore, there is an urgent need to bring global awareness and educate the public and seek cooperation to minimise these effects.

It is well recorded that due to ignorance, negligence, unplanned all-round growth, Industrialisation, modernisation etc., development of innovative materials for increasing comfort and security of living, ironically disturbed our environmental equilibrium. It resulted in pollution which is causing great concern. Over the last six decades, researchers, technologists and policy makers are making continuous efforts to minimise pollution. We as the global citizens have responsibility not to add additional load to the existing disequilibrium. To understand the extent of pollution and arrive at realistic assessment, frequent meetings, seminars and conferences provide good fora. These fora help exchanging ideas among experts and new comers, and know the current state of the art in the chosen subject. With this as the main objective, organisers planned a two day conference with environmental chemistry as the main theme. There is an emphatic paradigm shift in the subject of chemistry, materials science, environmental chemistry and many more branches of sciences towards environmental analytics such as reliable sampling methods, choosing the right sampling matrix, arriving at right method and above all, quality control and quality assessment of the measured data. This will help in realistic assessment as well as for decision making. As Chairman, Technical committee, an effort is made to cover areas like sediments, soils, water, air & atmosphere, radioactivity, new materials and methods. I am happy to share with the audience and participants that we could bring experts in all these areas and am hopeful that the intended purpose of the conference will be achieved.

Reddy, AVR

02-02-2019

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Dr. A.V.R. Reddy

Dr. A.V.R. Reddy joined Nuclear Chemistry Section, RCD, BARC in 1977 after Training School. Obtained Ph.D in Nuclear fission and did post-doc on extension of periodic Table in Mainz, Germany. Till Sept 2008, he was Head, Nuclear Chemistry Section and then was Head, Analytical Chemistry Division, BARC till 31-05-2015. He worked as professor in Chemistry in V S University, Nellore, AP for an year and presently he is Chief coordinator of Gemmological Institute of India, Mumbai. He has worked in the International Atomic Energy Agency (IAEA) during 1999-2000 as a technical officer. His areas of research are Nuclear fission, nuclear reactions, nuclear analytical techniques, non-destructive assay methods, electroanalytical chemistry and environmental science. He has about 700 publications (journals and symposia), coauthored 4 books and edited 30 books / compilations.

Visited many countries in Asia, Europe and South America, delivered more than 400 lectures in nuclear analytical techniques, nuclear chemistry, general chemistry, QA/QC, analytical chemistry, spectrometric methods, organic spectroscopy, chemical safety and research methodology. He was a visiting professor in Mumbai University for 15 years and was a professor of Homi Bhabha National Institute, DAE.

Dr. Reddy is a fellow of International Union of Pure and Applied Chemistry (IUPAC). He is an active member of many Scientific Associations and immediate past President of Indian Association of Nuclear Chemists and Allied Scientists (IANCAS). He worked as a commission member of IUPAC for three terms. Dr. Reddy worked with two funding agencies, Board of Research in Nuclear Sciences (BRNS) and Science and Engg Research Board (SERB). Dr. Reddy is on the Editorial Board of two international journals.

Nuclear Analytical Techniques for Environmental Monitoring

A.V.R. Reddy

Chief Coordinator, Gemmological Institute of India, Mumbai

Ex-Head, Analytical Chemistry Division, Bhabha Atomic Research Center, Trombay, Mumbai 400085

Analytical techniques that use nuclear properties or Analytical techniques that are used to study nuclear properties are known as nuclear analytical techniques (NATs). NATs are very useful in environmental monitoring in view of their sensitivity, simplicity and selectivity, and more importantly some of them are simultaneous multi element analysis techniques, e.g., neutron activation analysis (NAA). We have developed various methodologies of NAA and over the years applied them to study problems pertaining to environment, geochemistry, natural sciences, materials science, chemistry, physics, forensic science and food stuffs. Our methodology of internal standard NAA and standard less approach are being used to measure analytes present in various matrices. Our results in intercomparision exercises conducted by International Atomic Energy Agency (IAEA) using Peru pottery samples were declared as the best. During the talk, development of these methodologies will be discussed.

Adverse / beneficial effects depend on the interaction of species of different elements rather than the total content of that element, and speciation studies are very delicate & sensitive to laboratory variations like temperature, pressure and chemical reactions required during the analysis resulting in erroneous values that affect decision making in environmental issues. We combined our expertise in nuclear chemistry to develop sensors for speciation studies of chromium, mercury, uranium, antimony etc. based on colour development (optodes) as well as for measuring low levels of radioactivity. For the later part, a cost effective instrument was developed. Some of these will be discussed during the talk.

Prof. K. SESHAIAH, M.Sc., Ph.D.

(Commonwealth Academic Fellow UK – 2011)

UGC-BSR- Faculty Fellow

Department of Chemistry

Sri Venkateswara University

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Member State Level Expert Appraisal Committee- AP

Prof. K. Seshaiah joined as lecturer in the Department of Chemistry Sri Venkateswara University, Tirupati in 1989 and subsequently promoted as Associate Professor in 1998 and Professor (by selection) 2006 in the same department. He worked as PDF at Chaoyang University of Technology, Taiwan for two years and was awarded **Commonwealth Academic Fellowship** to work at University of Surrey, U. K. in the year 2011. Guided 23students for Ph.D. degrees and 7 students for M Phil., degrees in chemistry and published 95 papers with good impact factor and with total citation index of **2550, h- index of 23 and i-10 index of 35**. He has completed 8 research projects sponsored by DST, CSIR, BRNS and UGC and successfully completed one international research project under the **U K India Education Research Initiative (UKIERI)** in collaboration with Department of Chemistry, University of Surrey UK. He **was awarded Teacher of the Year Award by Govt of Andhra Pradesh, Amaravathi for the year 2016.**

Prof Seshaiah served the department of Chemistry, S V University as Head, Co-ordinator UGC-SAP-DRS program and chairman of Board of Studies. I also served as chairman of Board of studies in Pharmacy and as coordinator of RUSA, He worked as Warden of S V University College of Sciences Hostels for Men for 3 Years and as Vice Principal, S V Univerity College of Sciences. I served as Member academic senate of S V University and also as Member of Academic senate of Satavahana University, Karimnagar. **At present he is serving as State Level Expert Appraisal Committee of Andhra Pradesh** appointed by Ministry of Environment, Forest and Climate Change, New Delhi.

PRECONCENTRATION METHODS FOR TRACE METAL ANALYSES

K. Seshaiah

Department of Chemistry, Sri Venkateswara university, Tirupati -517502 (INDIA)

Abstract: Determination of low levels of trace metals in environmental and biological samples is of considerable interest, because at low levels they are essential and at high levels they are toxic. Various techniques, such as atomic absorption spectrometry (AAS), stripping voltammetry, inductively coupled plasma emission spectrometry (ICP-OES), and inductively coupled plasma-mass spectrometry (ICP-MS) have been applied to quantitatively determine trace levels in various samples. However, direct application of these spectroscopic methods for the determination of trace elements in environmental and biological systems is limited due to (i) sample matrix, (ii) spectral interference and (iii) most importantly low levels of species present in various matrices. This demands development of preconcentration and separation of trace elements from the matrix components and the methods should be as passive as possible so that the species' abundances are not altered while being preconcentrated. Among the preconcentration methods, SPE is a simple and effective technique due to its ability to reduce / eliminate interferences, improved the selectivity of the measurement and enhance the sensitivity. It should be noted that the adsorbent material plays a fundamentally crucial role in solid phase extraction. Thus, the development of new adsorbent material with high selectivity, stability and extraction efficiency for solid phase extraction of metals is of interest to analysts. Hence, attempts were made to develop new sorbents for the solidphase extraction of trace metals. Details are discussed in the full paper.

Prof. N. LAKSHMANA DAS
Emeritus Professor, GITAM (Deemed University), Visakhapatnam
Former Principal and Dean, GITAM Institute of Science
Advisor-Science courses, GITAM

Dr.N. Lakshmana Das is presently working as Emeritus Professor in GITAM. Earlier, he was Principal and Dean of GITAM Institute of Science, from May 2004 to June 2016 and Advisor, Science Courses from July 2016 to November 2018.

Dr.Lakshmana Das, a Ph.D. in Nuclear Physics from Andhra University in 1978, is an inter-disciplinary experimental scientist in the applied aspects of nuclear science and initiated nuclear based research in GITAM and established technical linkages with national laboratories like Bhabha Atomic Research Centre (BARC), Mumbai and CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad.

He successfully completed several research projects funded by UGC, UGC-DAE-CSR and BRNS. He also completed two important MoU projects with BARC and another MoU project is ongoing. His areas of interest include Neutron activation analysis , Environmental impact of industries around the proposed new BARC campus Visakhapatnam, Treatment of effluent using electron beam accelerator and Nationwide Environmental gamma radiation monitoring using TLDs in the states of AP and Telangana. He was also the initiator to undertake scientific studies on various Buddhist sites in Andhra Pradesh and in other states. In GITAM campus, he has established a BARC-technology based bio-gas plant, namely, Nisargruna), under MoU with TT & CD, BARC.

Prof. Lakshmana Das has about 75 publications in peer reviewed journals, presented papers in national and international conferences and also chaired many scientific sessions. He guided seven students for their Ph.D.work. He did his Post doctoral research in France, Italy and Poland. He was a visiting faculty at University of Nairobi, Kenya during 1990-92. He is an Executive member of IANCAS.

Environmental Radioactivity: Methods and Methodologies

N. Lakshmana Das, GITAM (Deemed University), Visakhapatnam

Man is exposed to different kinds of naturally occurring radiation which is often called background radiation. This includes radiation from outer space as well as radiation from sources on earth. Uranium, Thorium and their progenies, Potassium (K-40) are the main contributors of the back ground radiation. The short lived progeny of Thorium, namely, Radon (Rn-222) constitutes about 50% of the total background radiation. The activities are manifested in the form of alpha, beta and gamma radiations which are measured by using appropriate nuclear detectors, like gamma survey meters, smart Radon monitors, alpha, beta and gamma spectrometers. The radioactivity concentration has been increasing in the environment, though below the maximum permissible dose, as of now. The basic concepts of environmental radioactivity, its origin, and various existing methods involved in its measurement, with special emphasis on Radon are presented.

Dr. B. Nagender Nath

Dr. B. Nagender Nath retired as a Chief Scientist from CSIR-National Institute of Oceanography, Goa in the year 2017 after serving for 35 years. Basically, he is a Marine Geologist but has research interests in Marine Geochemistry, Offshore mineral resources, EIA of offshore mining, Environmental Geochemistry and Paleochemistry. He has published over 86 papers in SCI journals (with a cumulative impact factor of ~190 and >2000 citations), contributed chapters to 3 books and co-edited a special issue of an international journal. He has guided 8 Ph.Ds, 22 Masters, 18 interns from foreign countries and a number of Indian students. He served as a Faculty and Course Coordinator for AcSIR. He was conferred with the National Geoscience Award by Ministry of Mines, Government of India for the year 2012, visited several countries as Visiting Researcher/Professor or to deliver lectures, and was a member of Ph.D. evaluation committees of Uppsala University, Sweden and the Okayama University, Japan. Dr. Nath was involved in several nationally important projects, has participated and led a number of oceanographic expeditions.

Techniques in characterizing the coastal sediments for assessing the natural and anthropogenic sources

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The coastal areas such as rivers, estuaries, lagoons and inner continental shelf regions are major repositories of terrestrially derived sediments as well as vital habitats of aquatic life. In addition, they are the depocenters of material derived from human developmental activity on land and the coasts, which can affect the coastal ecosystems. It is estimated that about 80% of pollutants generated by mankind are discharged to the oceans in the coastal areas. Thus, for assessing the degree of contamination in coastal sediments, it is important to distinguish that fraction contributed from natural sources, as the chemistry of weathered products from different rock terrains can vary. Factors such as sediment grain size, calcium carbonate content, redox reactions within sediments and metal exposure time can also influence the spatial accumulation of metals in marine sediment.

Some of the topics that would be discussed include, 1) the techniques necessary for characterization of sediments, including the granulometry, mineralogy and geochemistry; 2) the advantages and pitfalls of different techniques of assessing the quality of sediment; 3) the experiments and analyses desired for evaluating the bioavailability and metal disassociation from sediments; 4) the sediment dating techniques necessary for evaluating the historical records of human interference and concluding with some examples of evaluation of coastal sediments.

Dr. Loka Subramanyam Sarma

Dr. Loka Subramanyam Sarma has an M. Sc (in the year 1993) and Ph. D degrees (in the year 2000) from Sri Venkateswara University, Tirupati. He was a **National Science Council Post Doctoral Fellow at National Taiwan University of Science and Technology, Taipei, Taiwan** and worked under the mentorship of Prof. Bing Joe Hwang on electrocatalysts for fuel cell reactions from **2001 to 2008**. Later, Dr Sarma received Alexander von Humboldt Fellow and continued his work on fuel cell electro catalysts at Technical University of Clausthal, Clausthal Zellerfeld, **Germany** in the year **2008~2009**. Dr. Sarma is presently holding Sr. Assistant Professor position in the department of chemistry, YOGI VEMANA UNIVERSITY, KADAPA, Andhra Pradesh. His research interests are design and synthesis of nanomaterials for energy applications, electrochemistry and fuel cells. Dr. Sarma published over 50 papers in various top-tired journals including ***Journal of the American Chemical Society (JACS), ACS Nano, Chemistry – an European Journal, Journal of the Physical Chemistry B & C, Langmuir*** etc, contributed 5 book chapters, and some of his works received **USA, Europe, and ROC patents**.

Nanoelectrocatalysis – challenges and opportunities for clean energy and environment

L. Subramanyam Sarma

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Electrocatalysts in nano-scale dimensions play a vital role in catalyzing important reactions like methanol oxidation reaction (MOR), ethanol oxidation reaction (EOR), formic acid oxidation reaction (FAOR), oxygen reduction reaction (ORR) involved in fuel cell devices. In order to realize the commercial viability of fuel cells highly active and durable electrocatalysts which can deliver promising activities over the long period of operation without undergoing degradation is very much needed.

In this presentation, important aspects of electrocatalysts covering the challenges and opportunities associated with this important burgeoning field will be discussed. In addition, the facile structure-controllable synthesis strategies developed in our research group utilizing the principles of chemical reduction, galvanic replacement methods and conducting carbon supports will be presented. In particular, bimetallic Pt-Ru,[1,2] Au-Pd,[3] Pt-Pd[4] with various structures like core-shell and alloy were fabricated and supported on reduced graphene oxide conducting supports. The resulting nanoelectrocatalysts were thoroughly characterized to assess the morphology and structures and studied the corresponding electrocatalytic activities using cyclic voltammetry, linear sweep voltammetry, chronoamperometry and will be discussed.

Acknowledgement: Award of a research project (No:SB/S1/PC-98/2012) from the Department of Science and Technology, New Delhi was greatly acknowledged.

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Dr. V. HIMABINDU

Dr. V. Himabindu is a Professor, Centre for Environment, and Co-ordinator, Centre for Alternative Energy Options, Centre for Environment, Institute of Science and Technology, Jawaharlal Nehru Technological University Hyderabad (JNTUH), India. She received Ph. D in Chemistry from JNTU Hyderabad. She is the recipient of 17 research and development grants from the prestigious Indian Govt. and Private organizations. She has authored and edited more than 120 peer- review articles.

Her research focuses on monitoring of Air, Water and Soil pollutants and their control technologies, Bio fuels production, Energy materials, Sequestration of CO_2 gases from industrial air emissions and Hydrogen energy.

POLLUTION CONTROL TECHNOLOGIES

Dr. V. HIMABINDU, Ph.D, PROFESSOR and HEAD *Centre for Environment, Institute of Science and Technology ,*

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD,Kukatpally, Hyderabad 500085, TELANGANA, INDIA

Worldwide, the environmental market represents around $800 billion and the global need for environmental technologies, able to control pollution in air, water and soil, is in continuous increase. The **control** of the emission of various contaminants into the environment which brings down the level of the **pollution** is done by various updated methods. The various conventional **technologies** which **control** the **pollution** are physical methods, chemical methods and biological methods etc. Process modification is also a popular technique to control the pollution. **Methods** of **air pollution control** can be divided into two categories: the **control** of particulate emissions and the **control** of gaseous emissions. Gaseous emissions are industrial products such as sulfur dioxide, carbon monoxide, and oxides of nitrogen also released during various manufacturing operations. Particulate removal techniques include cyclonic collectors and wet scrubbers, bag house fabric filters, electrostatic precipitators, etc. Gaseous pollutants are separated from the inert air stream through processes, such as condensation, absorption, adsorption, etc. Waste water treatment can be done by physical methods like sedimentation, sand filtration, membrane filtration, adsorption etc, chemical methods like coagulation, advanced oxidation processes and biological methods like aerobic and anaerobic treatment. Waste reuse, recovery and waste to energy options are considered as advanced environmentally sustainable management options.

ORAL PRESENTATIONS

IBX/KI Promoted Synthesis of 2,5-Disubstituted 1,3,4-Oxadiazoles

G. Raveendra Reddy* and Luo Yunfei

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Abstract

Oxadiazoles are privileged scaffolds in different areas of medicinal, pesticidal, polymer and material science. They act as anticancer, benzodiazepine receptor agonists, antimicrobial, analgesic, diuretic and tyrosinase inhibitors etc. A number of compounds containing an oxadiazole moiety are in late stage clinical trials including zibotentan and furamizole. Despite numerous methods are reported, the majority of them suffer from major drawbacks such as the use of strong alkaline or acidic conditions, highly toxic and corrosive reagents and also involve the use of costly reagents, elevated temperatures and longer reaction times. Inspired by the potential application of hypervalent iodonium reagents in organic synthesis, we would like to explore the readily available IBX and KI reagents for the facile synthesis of 1,3,4-oxadiazoles.

Keywords

Arylhydrazides, aldehydes, anticancer, corrosive reagents, 1,3,4-oxadiazoles, oxidative cyclization.

Synthesis and Biological Evaluation of certain Pyrazoline Clubbed 1, 3-Thiazolone Derivatives Bearing Thieno [2, 3-d] Pyrimidine Nucleus

Virupakshi Prabhakar[*1], Kondra Sudhakar Babu[2], Borigarla Subramanyam[3]

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Abstract

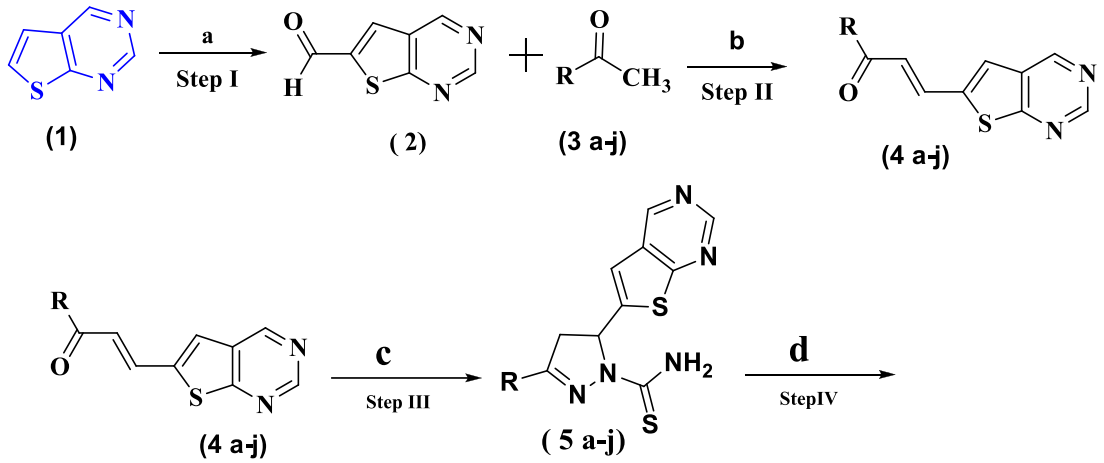
A new series of 2-(5-thieno[2,3-d]pyrimidin-6-yl) -3-p-Substituted -4,5-dihydro- 1H-pyrazol-1-yl)thiaz ol-5(4H)-one derivatives (6 a-j)were synthesized by reacting 3-(thieno[2,3-d]pyrimidin-6yl)-1-p-substituted prop-2-en-1-one(4a-4j) with thio Semi carbazide and Ethyl bromo acetate respectively. All these compounds were characterized by means of their IR, ^{1}H NMR, ^{13}C NMR, mass spectral data and microanalysis. All the synthesized products were evaluated for their antimicrobial activity. All the compounds exhibited significant to moderate antimicrobial activity. Where Compounds 5e, 5d, 5i and 5g demonstrated good antimicrobial activity against all the tested microbial stains compared with Standard Drugs.

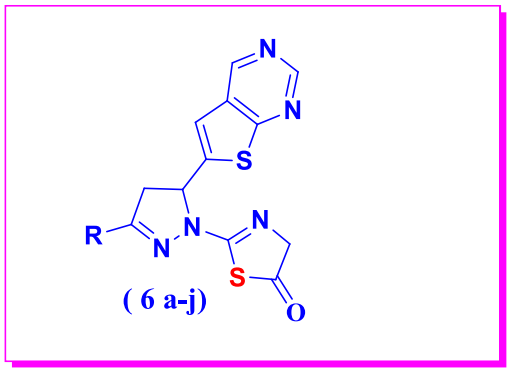
Key Words

pyrazoline; thiazolone; Thieno [2, 3-d] Pyrimidine Nucleus, biological evaluation.

2-(5-(thieno[2,3-d]pyrimidin-6-yl)

Synthetic Scheme





R = -Phenyl, -4 Methyl phenyl, -4 Methoxy phenyl, -4 tri fluoro methoxy phenyl, -4 Tri fluoro phenyl, -4 Nitro phenyl, - pyrazin-2-yl, - pyridin-4-yl, Thiophene 2-yl, Furan-2-yl acetyl groups.

Scheme: Synthetic path way of preparation of Novel Pyrazolines Clubbed 1, 3-Thiazolone Derivatives Bearing Thieno [2, 3-d] Pyrimidine Nucleus(6 a-j).

Reagents and Reaction conditions: (a) DMF,$POCl_3$,80^OC,4hrs (b) NaOH,Ethanol, RT, 24 hrs (c) Thio Semi carbazide (**NH_2-C=S-NH-NH_2.HCl**) , Ethanol, NaOH, Reflux, 6hrs (d)Ethyl bromo acetate, Ethanol, Reflux, 2 hrrs.

Adsorption of fluoride from aqueous solution by *Trigonella foenum-graecum* seed powder and *Papaver Somniferum* seed powder - A comparative study

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Abstract

The removal of fluoride ion in aqueous solution by using naturally and abundantly available low cost biosorbents of Trigonella foenum-graecum (Fenugreek) seed powder and Papaver Somniferum (Poppy) seed powder is studied. The results of fluoride adsorption were compared. Further, the biosorbents were characterized by FTIR, SEM and surface area analysis.The effect of various operating parameters such as pH, contact time, concentration of fluoride and amount of biosorbent were studied to find the adsorption efficiency. The equilibrium data were used to study the kinetics of defluoridation process such as pseudo first order, pseudo-second order and Weber–Morris intraparticle diffusion models. The adsorption data were analyzed using Langmuir and Freundlich adsorption isotherms. Break through curves were obtained from column flow adsorption data. The maximum monolayer adsorption of fluoride on of Trigonella foenum-graecum seed powder (TGSP) and Papaver Somniferum seed powder (PSSP)are found to be 75.8 and 62.6mg/g. The experimental results showed that TGSP had more potential than PSSP for removal of fluoride ion in drinking water.

Key words

TGSP, PSSP, Fluoride, Adsorption, Isotherms, Kinetics.

Adsorption of methylene blue and malachite green dyes from aqueous solution by Soya bean seed powder-equilibrium isothermal modeling

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Abstract

This study was aimed at using Soya bean seed powder (SSP) as a potential adsorbent to remove methylene blue (MB) and malachite green (MG) dyes from aqueous solution. The

SSP powder was used without any modification. In a batch adsorption system as a function of pH, contact time, adsorbent dose, and initial concentration of dyes was evaluated. Maximum removal of MB and MG dyes were observed at pH 6.0 and 5.0 respectively. The equilibrium uptake was increased with an increase in the initial dye concentration in the solution. Adsorption kinetic data were properly fitted with the pseudo second order kinetic model. The experimental isotherms data were analysed using Langmuir and Freundlich isotherm equations. The best fit was obtained by the Langmuir model with high correlation co efficient R^2 = 0.9962, R^2= 0.9998 with a maximum monolayer adsorption capacity of 149.25 mg/g for Methylene Blue and 232.55 mg/g for Malachite Green. The adsorbent was analysed by using Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM) for determination of functional groups and surface morphology respectively.

Key words

Methylene blue (MB) Malachite green (MG), Soya bean seed powder (SSP), Characterization, Modeling.

A Solution to the Environmental Pollution by means of Aeroponic Irrigation System- A Research Study

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Abstract

Due to the increased economic and industrial development needs for the population has created environmental imbalance. As a result Environmental pollution hasbecome a global burning issue for the past few decades. Hence for the chemical community it is a challenging task to search for more efficient way of performing chemical transformations. One of the solution is to introduce Eco-friendly reactions by means of Green Chemistry and effective usage of them in the chemicals, drugs, medicines etc proves that "Better Chemistry-Better Human Health- Better Environment".

The recirculating hydroponic culture techniques, such as Aeroponics, have severaladvantages over traditional agriculture, aimed to improve the efficiency of environmental impact on agriculture. These techniques require continuous monitoring and automation for proper operation. In this work we are proposing an automatic monitored Aeroponic-irrigation system based on the Arduino's free software platform. Analog and digital sensors for measuring the temperature, level of a nutrient solution in a real greenhouse were implemented. In addition, the pH and electric conductivity of nutritive solutions are monitored using the Arduino's differential configuration. The sensor network, the acquisition and automation system are managed by two Arduino's modules in master-slave configuration, which communicate one each other wireless by Wi-Fi. Further, data are stored in micro SD memories and the information is loaded on a web page in real time. The developed device brings important agronomic information. The system also could be employ as an early warning system to prevent irrigation malfunctions.

Keywords

Hydroponics, Aeroponics, Arduino Processor, Environmental Pollution, Green Synthesis

Synthesis and characterization of chemical bath deposited SnS thin films

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Abstract

Tin (II) sulphide (SnS), a direct band gap semiconductor compound, has recently received great attention due to its unique properties like low cost, absence of toxicity and good abundance in nature.This material could have novel applications in optoelectronics including solar cell devices, sensors and batteries and also in biomedical sciences.SnS has been synthesized and studied in the form of single-crystals and thin-films. Most of the SnS single-crystals have been synthesized by Bridgeman technique, whereas thin films have been developed using different physical as well as chemical deposition techniques. The synthesis or development of SnSthin films by chemical bath deposition technique and their unique properties are studied in this paper.At room temperature SnS exhibits double-layered orthorhombic crystal structure and energy band gap of thelayers varied from 1.41 eV to 1.30 eV.

Keywords

SnS, Thin film, Chemical bath deposition

Synthesis, characterization and antimicrobial evaluation of novel compounds of 3-((benzo[d]thiazol-2-ylmethyl)amino) -1- (2,5-difluorobenzoyl)-4-(2-(4-(substituted)phenyl)hydrazono)-1 H-pyrazol-5(4H)-one

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Abstract

New novel derivatives of 3-((benzo[d]thiazol-2-ylmethyl)amino)-1- (2,5-difluorobenzoyl) -4-(2-(4-(substituted)phenyl)hydrazono)-1H-pyrazol-5(4H)-one (2a-g) were prepared by refluxing a mixture of ethyl 2-(4-(2-(4-subtituted methyl)phenyl)hydrazono)-1-(2,5-difluorobenzoyl)-4,5-dihydro-5-oxo-1H-pyrazol-3-yl)amino Carboxylic acid. (1a-g) and 2-amino thio phenol

Methods: The newly synthesized compounds were characterized by IR, ^{1}H-NMR, ^{13}C-NMR, mass spectra & Elemental analysis. The newly synthesized compounds were screened for their Biological activity**.**

Key words

Benzthozole, 2-amino thio phenol, ,Antibacterial and Antifungal activity, spectral data.

Synthesis, characterization and antimicrobial evaluation of novel compounds of 3-((benzo[d]thiazol-2-ylmethyl) amino)-1- (2,5-difluorobenzoyl)-4-(2-(4-(substituted)phenyl)hydrazono)-1 H-pyrazol-5(4H)-one

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Abstract

New novel derivatives of 3-((benzo[d]thiazol-2-ylmethyl)amino)-1- (2,5-difluorobenzoyl)-4-(2-(4-(substituted)phenyl)hydrazono)-1H-pyrazol-5(4H)-one (2a-g) were prepared by refluxing a mixture of ethyl 2-(4-(2-(4-subtituted methyl) phenyl)hydrazono)-1-(2,5-difluorobenzoyl)-4,5-dihydro-5-oxo-1H-pyrazol-3-yl)amino Carboxylic acid. (1a-g) and 2-amino thio phenol

Methods: The newly synthesized compounds were characterized by IR, ^{1}H-NMR, ^{13}C-NMR, mass spectra & Elemental analysis. The newly synthesized compounds were screened for their Biological activity**.**

Key words

Benzthozole, 2-amino thio phenol, Antibacterial and Antifungal activity,spectral data.

The Effects of Air Pollution on the Health of Children

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Abstract

The present article is intended to inform pediatricians about the associations between ambient air pollution and adverse health outcomes in children within the context of current epidemiological evidence. The majority of the current literature pertains to adverse respiratory health outcomes, including asthma, other respiratory symptoms, and deficits in lung function and growth, as well as exposure to ambient levels of criteria air pollutants. In addition to the above, the present article highlights mortality, pregnancy outcomes, vitamin D deficiency and alteration in the immune system of children. Some of the data on the impact of improved air quality on children's health are provided, including the reduction of air pollution in former East Germany following the reunification of Germany, as well as the reduction in the rates of childhood asthma events during the 1996 Summer Olympics in Atlanta, Georgia, due to a reduction in local motor vehicle traffic. However, there are many other toxic air pollutants that are regularly released into the air. These pollutants, which are not regularly monitored and have not been adequately researched, are also potentially harmful to children.

Significant morbidity and mortality is attributed to ambient air pollution, resulting in a significant economic cost to society. Air pollution issues need to be a priority in order to protect the health of children and support sustainable development for future generations.

Keywords

Air pollution, Children, Environmental health, Health outcomes

Volumetric , Ultrasonic and Viscometric studies of binary mixtures of chloro benzene with o-cresol, m-cresol and p-cresol at T=303.15 K and 313.15K.

N.Harikrishna[1] V. Syamala[2], and K. Siva Kumar[3]

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Abstract

Excess volumes (V^E), ultrasonic sound velocities (u), viscosities (η) for the binary mixtures of chlorobenzene with o-cresol, m-cresol and, p-cresol, are measured at 303.15 K and 313.15K. Isentropic compresibilities (K_s) have been computed for the same systems from precise sound velocity and density data. Further, deviation is isentropic compressibility (ΔK_s) from ideal behavior was also calculated. ΔK_s values are negative over the entire volume fraction range in all the binary mixtures. The experimental sound velocity data are analysed interms of Free Length Theory (FLT) and Collision Factor Theory (CFT). From the viscosity data, deviation in viscosity and interaction parameters for various models were also calculated. The measured data were discussed on the basis of intermolecular interactions between unlike molecules.

Key words

Densitometer; excess volume ; Interferometer; isentropic compressibilities, sound velocity, Viscosities.

Electro analytical techniques for probing the study of neurotransmitter dopamine

M. Lavanya

Abstract

Memory is an essential element to adaptive behaviour since it allows consolidation of past experience guiding the subject to consider them in future experiences. Among the endogenous molecules that participate in the consolidation of memory, including the drug-seeking reward, considered as a form of learning, is dopamine (DA). Extensive research has emerged as one of the primary alternatives for studying neurobiology due to its less invasive

implantation and enhanced temporal resolution mechanisms involved in release and regulation may allow us to develop potential pharmacological solutions. However, cyclic voltammetry (CV) has emerged as one of the primary alternative method for thedetection of DA. DA oxidation was carried out electrochemically, by using Zero valent nano iron (ZVNI) particles. This chemically modified electrode showed a fivefold enhancement in the oxidation peak current when compared to the bare carbon paste electrode(BCPE) at a scan rate of 50 mVs^{-1}. Scan rate was linearly proportional to the anodic peak current with a correlation coefficient of 0.9932 indicating that it is a diffusion controlled reaction. So, the proposed electro-chemical method was used to analyze the DA in brain chemistry and its role in neurobiology. The developed method was successfully evaluated with analytical merits like detection level, fast response, sensitivity, selectivity, stability, reproducibility and reliability.

Keywords

Dopamine (DA), Bare Carbon Paste Electrode(BCPE), Zero valent nano iron (ZVNI) particles, Cyclic voltammetry (CV)

Microplastics: an unseen threat to marine and fresh water ecosystems

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Abstract

The leaching of microplastics in to the freshwater and marine ecosystems is of major concern as they pose serious threat to aquatic receptors. However, information related to the potential effects of microplastics in the aquatic biota is still at its infancy. This is mainly due to the lack of sound knowledge about the microplastic pollution in terms of their sources and their associated contaminants and the mechanisms underlying their toxic effects in aquatic life. Considering these points, the present study was aimed to address the current state of knowledge of microplastic in the aquatic environments; in particular, their sources, their fate in the environment, and their toxicological effects in aquatic organisms. To accomplish this task, this study was categorized into three aspects. The first aspect provides clear-cut information about the root-causes for the entry of microplastics into the aquatic environment. The second aspect focuses on the toxic effects of microplastics in the aquatic receptors and the possible mechanisms underlying the microplastics-induced toxicity. In order to address these two aspects, at least 120 peer-reviewed articles investigating micropalstic pollution were critically analyzed. Finally, the need for scientific research to address the present and the projected plastic contamination are proposed.

Key words

Microplastics, risk to aquatic receptors, priority pollutants, literature review

Biosynthesis, characterization, antibacterial and toxicity studies of silver nanopartciles using ethanolic extracts of Murraya koenigii

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Abstract

The antibacterial activities of silver nanoparticles synthesized via green synthesis are well acknowledged. The present study elaborates the green synthesis of silver nanoparticles in an eco-friendly way. In the present study, silver nanoparticles were synthesized using the ethanolic leaf extracts of Murraya koenigii (MKAgNps). The synthesized MKAgNps were analyzed via UV-visible spectroscopy, SEM and FTIR analysis. UV-visible spectroscopic data showed a characteristic peak of AgNPs at 435 nm. Analysis of MKAgNps morphology via SEM revealed that the synthesized AgNPs were spherical and ranged in size from 5 to 45 nm. FT-IR analysis also revealed characteristic peaks which were responsible for the capping and efficient stabilization of leaf extracts of M.koenigii with AgNPs. The synthesized MKAgNPs also showed antibacterial activity against the selected gram positive and gram negative bacteria. Further, to know whether the synthesis of MKAgNPs were eco-friendly or not, chickpea seeds were exposed to MKAgNPs and evaluated the oxidative stress parameters. No significant changes in the lipid peroxidation levels were noticed in the chickpea seeds exposed to MKAgNPs. On the other hand, the activity levels of antioxidant enzymes like POD, SOD ($p<0.01$) and CAT ($p<0.01$) were significantly enhanced as compared to controls.

Key words

Antibacterial activity, Green synthesis, Murraya koenigii, silver nanoparticles, toxicitystudies

Zebrafish (Danio rerio) as a model organism to evaluate the toxicity of environmental pollutant cyepermethrin and its metabolites

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Abstract

The present study was aimed to investigate the effect of cypermethrin on the reproductive ability of male and female adult zebrafish (Danio rerio). The adult zebrafish of both sexes were exposed to cypermethrin at three selected concentrations 0.1, 1.0 and 10µg/L over a period of 21days. No significant changes were observed in the cumulative fecundity rates in experimental fishes over controls. No significant changes were noticed in the plasma vitellogenin levels of male zebrafish exposed to cypermethrin at 10µg/L over controls. Similar trend was noticed in the plasma vitellogenin levels of female zebrafish. No marked differences were observed in the testicular architecture of cypermethrin (10µg/L) exposed male zebrafish over controls. However, the spermatozoa number was significantly reduced in cypermethrin (10µg/L) exposed male zebrafish as compared to controls. On the other hand, no significant differences were recorded in the ovarian architecture of cypermethrin exposed over control fishes. Estrogen signalling plays a key role in the regulation of spermatogenesis. Therefore, in silico analysis was performed to know the interactions of zebrafish estrogen receptors [α (agonist and antagonist), β1, and β2] with cypermethrin and its metabolites cyclopropyl Acid, 3-phenoxybenzaldehyde and 3-phenoxybenzoic acid. Our results indicated that cypermethrin could able to bind zebrafish estrogen receptor β1with almost similar binding energies to that of reference molecules (estradiol and ethylestradiol). Further, cypermethrin and its metabolites phenoxybenzaldehyde and 3-phenoxybenzoic acid interactions with zebrafish estrogen receptor α might suggest that these molecules exhibit antagonistic properties. To conclude, cypermethrin at higher dose could able to induce spermatotoxic effects in male zebrafish. Our in silico analysis provide basic information about the interactions of cypermethrin with estrogen receptors. Thus, studies encompassing the effect of cypermethrin on the expression levels of zebrafish estrogen receptors mRNA with regard to male reproduction might provide valuable insights into the mechanistic action of chemicals with estrogenic properties and their interference with spermatogenesis.

Keywords

Cypemethrin, estrogen receptors, spermatogenesis, zebrafish

Pila globosa, a freshwater snail as a model organism to evaluate the mechanism(s) underlying arsenic-induced toxicity

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Abstract

Arsenic contamination in the environment is a serious ongoing problem all over the world including India. The present study was aimed to investigate the effect on the changes in the oxidative stress biomarkers in selected tissues of the freshwater snail, pila globosa.

Significant elevation in the lipid peroxidation and the protein carbonyl content accompanied by a significant reduction in the enzymatic (superoxide dismutase, catalase, glutathione reductase, glutathione peroxidase, glutathione –s- transferase) and non enzymatic (reduced glutathione) antioxidants were observed in the digestive gland and mantle of the snail exposed to sodium arsenite (25 ppm) over a period of 72 hrs. Arsenic content in the selected tissues were significantly increased in the sodium arsenite exposed snails as compared to controls. Histological analysis of the digestive gland and the mantle showed considerable damage following arsenic intoxication. From the results, it can be concluded that the exposure of snails to sodium arsenite declines antioxidant system thereby causes oxidative damage in the selected tissues of the snails. Moreover, the present study provides valuable information at the level of eco-toxicological perspective.

Key words

Arsenic, digestive gland, mantle oxidative stress, and Pila globosa

Attenuation of DNA damage by Herbal Extracts of Caralluma bhupinderana sarkaria

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Abstract

Caralluma bhupinderana sarkaria is a succulent plant found in dry regions of South India belongs to the family Apocyanaceae and was collected from hills of Vallnadu, Thirunelveni dt,Tamilnadu, India. The pregnane glycosides of Caralluma have been shown to possess anti cancer and anti tumour properties. Few studies has been reported that Carallumas are effectively protect gastric mucosa. Caralluma plants are rich in natural bio active compounds like flavonoids, alkaloids, phenolic compound etc., which play a vital role in protecting from various life threatening diseases. The present study aims to screen the protective activity of aqueous and methanolic extracts of C.bhupinderana against the DNA damage caused by the oxidative insults. The extracts were screened for their ability to prevent PET 28-A plasmid DNA from damage by ultra violet rays induced photolysis of Hydrogen Peroxide (4%). Both aqueous and methanolic extracts significantly prevented DNA damage by UV rays and H_2O_2. The results infer that UV photolysed H_2O_2 of PET 28-A plasmid destroy the entire DNA, while 50 ug/ml of aqueous and methanol extracts attenuated the DNA damage which might be due to high antioxidase activity of C.bhupenderana.

Key words

C.bhupenderana, Antioxidant, DNA damage

An Introduction: Santalum album (sandalwood)

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Abstract

Santalum album L. (Santalaceae) commonly known as Indian Sandalwood is one of the oldest and precious sources of natural fragrance with immense medicinal and commercial significance. S. album has been grown in India for the last 25 centuries and esteemed all over the world for its sweet, long-lasting and medicinally valued fragrant oil. Sandalwood and the essential oil derived from sandal heartwood have been used in various traditional systems of medicine, Ayurveda, Siddha and Unani medicine in the treatment and prevention of wide range of ailments. The versatile therapeutic and healthcare importance of sandawood is attributed to the rich source of phytochemicals particularly sesquiterpeness. Modern pharmacological studies have demonstrated a wide range of pharmacological activities ranging from antibacterial to anti-cancer. No significant toxicity has been indicated by sandalwood oil and its individual constituents however, further study on chemical constituents and their mechanisms in exhibiting certain biological activities are needed to understand the full phytochemical profile and the complex pharmacological effects of this plant. antimicrobial, antioxidant, antiseptic, antipyretic etc.

Key Words

Santalum album, Ethnopharmacology, Phytochemistry, Biological activity.

Green Alternatives- Renewable Source of Energy

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Abstract

Due to rapidly expanding population the amount of biowastes is also increasing in the environment. In metropolitan cities in India thousands tonnes of wastes are generated every day. It has threatened an alarm to the environment. In recent years various technologies are being developed to utilise the biomass and waste to generate different forms of energy so that people's energy requirement can be met and environment can be protected from the possible

hazards. India has a vast supply of renewable energy resources it has one of the largest programme in the world for deploying renewable energy products and systems. The only country in the world to have an exclusive Ministry for Renewable Energy Development. The Ministry of Non-conventional Energy sources (MNES). The ministry has launched one of the world largest and most ambitous programme as renewable energy.The alternative source of energy has become very important and relevant to todays world. These sources such as the sun and wind can never be exhausted and therefore are renewable. Most of the renewable sources of energy are fairly nonpolluting and considered clean through biomass.Biomass based energy has been fulfills the human need. There is a basic need to develop techonologies and standardized techniques to reach to village level among the various non conventional sources of energy. Forest biomass plays a significant role in solving the fuel wood crisis. India is the biggest fuel wood producing country in the world. Many countries are promoting research and development activities in biomass energy. FAO, IDRS, UNEP, UNIDO, WHO are also engaged in bioenergy research programmes. In addition to non-fossil energy sources such as wind, hydro, waves, ocean thermal, geothermal and tidal. In Gujarat CEA at Kutch Tidal Power Project doing specific areas of the Indian Coastline that 900 MW electricity can be generated. Energy from wind can also be utilized by technological breakthrough in many states wind mills are setup for various purposes.

Key Words

Energy sources, Biomass, MNES

A facile in-situ development of L-Valine film onto the surface of carbon paste electrode towards the detection of environmentally hazardous 4-amino phenol

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Abstract

A small scale of environmentally hazardous 4-aminophenol can show significant impact on human health. Hence, in the present work, we have designed L-Valine film (Vf) modified carbon paste electrode (Vf/CPE) for the determination of 4-aminophenol. Herein, a facile in-situ L-Valine film was developed by electrochemical polymerization method onto the surface of bare carbon paste electrode (BCPE) with the help of cyclic voltammetry (CV) technique.

A two-folds of electrochemical peak current enhancement was achieved at Vf/CPE in comparison with BCPE towards the determination of 4-aminophenol in optimum pH 7.0 of phosphate buffer solution (PBS). This was achieved due to the large surface area and conductive nature of Vf/CPE, which was concluded through the techniques of cyclic voltammetry and electrochemical impedance spectroscopy (EIS). The effect of pH of buffer and scan rate studies were successfully studied. Morphological changes of BCPE and Vf/CPE was studied with the help of scanning electron microscopy (SEM). Under the optimized conditions, the limit of detection (LOD) and limit of quantification (LOQ) values of 4-aminophenol were estimated with the aid of chronoamperometry (CA) technique and was found to be as 9.8 µM and 32 µM respectively. Finally the proposed method was found to have satisfactory repeatability, reproducibility and stability results with low relative standard deviation (RSD) values.

Keywords

4-aminophenol, L-Valine film, Cyclic voltammetry, Electrochemical impedance spectroscopy and Chronoamperometry.

Fabrication of Flower like Pt-Cu Nanopartices on Reduced Graphene Oxide for Efficient Electrocatalytic Oxygen Reduction Reaction

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Abstract

Ultrathin Pt–based nanoparticles shows promising activity towards oxygen reduction reaction (ORR) and are currently in demand to realize fuel cells as power generating devices. In this presentation, we show a simple method for the fabrication of flower-like Pt-Cu nanostructures deposited on reduced graphene oxide (RGO) supports. Moreover, combination of flower-like Pt-Cu nanostructures with graphene oxide (GO) could further increase the electrocatalytic performance. A one- pot chemical reduction method utilizing ethylene glycol both as a solvent and reducing agent without any additional involvement of surfactants and pH maintenance was developed to fabricate Pt-Cu nanoparticles on RGO support. As prepared Pt-Cu/RGO catalysts were characterized by various techniques, such as X-ray diffraction spectroscopy (XRD), transmission electron microscopy (TEM), energy dispersive X-ray spectroscopy (EDX), scanning electron microscopy (SEM), Raman spectroscopy, cyclic voltammetry and linear sweep voltammetry (LSV). The as–prepared flower-like PtCu/RGO nanostructures exhibited significantly higher specific activity than commercial Pt/C towards oxygen reduction reaction (ORR). The present chemical reduction method will

be significantly helpful to the further design nanocomposites with desired properties relevant to ORR applications.

Acknowledgement

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POSTER PRESENTATIONS

An Efficient One-Pot Green Protocol For The Synthesis Of Substituted Pyridopyridine Derivatives Using Recyclable Amberlyst 15 Dry As A Heterogeneous Catalyst Via Three Component Reaction.

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Abstract

A novel and efficient protocol is developed for the synthesis of various pyridopyridine derivatives via the three component condensation of aldehydes, cyclic active methylene comound (dimedon,barbituric acid) and 2-amino pyridine in water. Amberlyst 15 dry is a bead form, strongly acidic ion exchange resin developed particularly for heterogeneous acid catalysis of a wide variety of organic reactions. It is also useful in non aqueous ion exchange system for the removal of cationic impurities. This method provides several advantages such as being environmentally benign, short reaction time, possessing high yields with increased variations of the substituents in the product and preparative simplicity.

Keywords

green synthesis, pyrimidinone derivatives, amberlyst 15 dry, heterogeneous catalysis

Role of Plants in Phytoremediation

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***Abstract*:**

Plants can play an important role in environmental remediation. Number of aquatic plants such as water hyacinth (Eichhornia crassipes), duckweed (Lemna minor), water velvet (Azolla pinnata), pennywort (Hydrocotyle umbellata) etc., can accumulate heavy metals from contaminated water. These plants can provide nitrate removal, and can play an important role in the process of Phytoremediation because they can absorb excess mineral nutrients, particularly nitrogen and phosphates. For these reasons, they are touted as water purifiers of unexploited value. Some of terrestrial plants like Indian mustard (Brassica juncea), New Caledonian tree (Sebertia accuminata), sun flower (Helianthus annuus) etc., can be used for environmental remediation. Crop plants such as Indian mustard can be used to extract heavy metals from soil. These plants can absorb heavy metals from the soil and they transport them to the leaves and stalks of plants. Water hyacinth propagates at a phenomenal rate and occupies a large space within a short period of time. It can be used for purifying not only domestic wastewater but also industrial wastewater. It can readily absorb and accumulate heavy metals such as Pb, Fe, Cu, Cd, Hg and Ni. It also absorbs various organic chemicals like phenols and toxaphene and removes even radioactive metals from effluents. Datura innoxia can remove a wide variety of metal ions from soil solutions. Further advances in Phytoremediation require a multidisciplinary approach, covering fields as diverse as agricultural engineering, plant biology, agronomy, soil science, microbiology and genetic engineering. Phytoremediation of heavy metals is designed to concentrate metals in plant tissues, thus minimizing the amount of hazardous waste, which needs to be treated and deposited at hazardous waste sites. But an economical method of reclaiming metals from plant residue should be developed. We can follow different methods for concentration of metals in plant tissues that include sun, heat or air drying, environmentally safe incineration, composting, pressing, compacting, and acid leaching. These plants can then be harvested and burned to recover the metals.

Key words

Phytoremediation, Eichhornia crassipes, Azolla pinnata, Brassica juncea, hazardous,

Application of the Prigogine-Flory-Patterson theory to excess molar volumes of benzyl alcohol with chlorinated compounds

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***Abstract*:**

Excess molar volumes of benzyl alcohol with chlorinated compounds (1, 2-dichloro ethane, 1, 1, 1-trichloroethane, 1, 1, 2, 2- tetrachloroethane, trichloroethylene and tetrachloroethylene) as a function of composition under atmospheric pressure at 303.15 K have been used to test the applicability of Prigogine-Flory-Patterson Theory. An analysis of each of the three contributions namely the interactional, the free volume and the characteristic pressure terms, so that the interactional and the free volume contribution were positive for all five binary mixtures. The characterstic pressure contribution was positive for the binary mixtures of benzyl alcohol with 1, 2-dichloro ethane, 1, 1, 2, 2-tetrachloro ethane, tetrachloroethylene and negative for Benzylalcohol with 1,1,1-trichloro ethane and trichloroethylene. The correlation between the excess molar volumes calculated from PFP theory and experimental excess molar volume data was satisfactory for all the studied binary systems. An attempt was made for investigation of solute- solvent interactions and structural features of each component in the studied mixtures using PFP theory.

Keywords

Excess molar volume, benzyl alcohol, 1, 2-dichloro ethane, 1, 1, 2, 2-tetrachloro ethane, tetrachloroethylene, 1, 1, 1-trichloroethane and trichloroethylene, Prigogine-Flory-Patterson Theory,

Assessment of Heavy Metal Contaminations of Plants in Industrial Regions of Chittoor District

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Abstract

Many metals are needed for the growth of plants in low concentrations, their excessive amounts in soil above threshold values can result in toxicity. This detrimental effect varies with the nature of an element as well as plant species. Heavy metal toxicity in plants depends on the bioavailability of these elements in soil solution, which is a function of P_H, organic matter and cation exchange capacity of the soil.

The analysis of plants for heavy metal contamination is an important step in ensuring human and environmental health. Plants growing on heavy metal polluted soil show a reduction in the growth due to changes in their physiological and biomedical activities. The present study is focused on the determination of five heavy metals, and the digestions of

leaves sample with acids were analyzed by using hot plate. The total concentration of heavy metals like cadmium (Cd), Lead (Pb), chromium (Cr), Iron (Fe) and Nickel (Ni) was determined by Atomic absorption spectroscopy (AAs) in Tirupati around chittoor district industrial regions. Our results are showing that, in the three study areas all the heavy metals are in the above permissible limits. This study reveals that plants grown in these polluted sites shows the higher concentrations of the metals which show acute and chronic toxic effects on plants and also to humans there is an urgent need.

Key words

Heavy metals, Industrial waste water growing plants, Atomic Absorption spectroscopy.

Biogenic synthesis of metal and metal oxide nanoparticles and its potential applications.

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Abstract

In the present study, biogenic synthesis of metal and metal oxide nanoparticles was carried out by using aqueous leaf extract of Ocimum tenuiflorum. This method was very precious due to their economic and eco-friendly benefits. The microwave assisted biogenic synthesized NPs were characterized and analyzed by various instruments such as ultraviolet-visible spectroscopy (UV-vis), fourier transform infrared spectroscopy (FT-IR), powder X-ray diffraction (XRD), transmission electron microscopy (TEM) and scanning electron microscopy (SEM) coupled with X-ray energy dispersive spectroscopy (EDS). The biosynthesis of nanoparticles has been proposed as a cost-effective and environmentally friendly alternative to chemical and physical methods. Plant-mediated synthesis of nanoparticles is a green chemistry approach that connects nanotechnology with plants. Novel methods of ideally synthesizing NPs are thus thought that are formed at ambient temperatures, neutral pH, low costs and environmentally friendly fashion. Present work focuses on plants based green synthesis of MoO3, Ag@ Fe3O4 NPs and their potential applications.

Keywords

MoO3, Ag@ Fe3O4 NPs; Eco-friendly; Antibacterial activity.

Adsorptive Stripping Voltammetric Determination of Anticancer Drug Nisoldipine

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Abstract

The electrochemical behaviour of the anticancer drug Nisoldipine at a hanging mercury drop electrode (HMDE) is investigated. Adsorptive stripping voltammetry (AdSV) was used to determine nisoldipine in the presence of Britton-Robinson buffer at ph 8.0. different parameters such as, supporting electrolyte, pH, accumulation potential, accumulation time and scan rate were tested to optimize the conditions for the determination of nisoldipine. The adsorbed form is reduced irreversibly. The linear concentration range is adsorbed form is reduced irreversibly. The linear concentration range is from $1.25x10^{-4}$ to $2.25x10^{-8}$M nisoldipine. The detection limit of $1.85x10^{-8}$M withaccumulation time 60sec. determined successfully. The method was applied to the analysis of tablets and spiked urine, with recoveries of 99.80 ± 0.07, 99.30 ± 2.27, 99.90 ± 1.2 respectively.

Key Words

Nisoldipine, adsorptive stripping voltammetry, serum samples

Feasibility of ground water quality for drinking in selected areas of Chittoor and its suburb mandals, Andhrapradesh

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Abstract

Water is one of the most needed precious substances for the sustainability of human life, animals and plants. It is known as “Elixir of life”. The amount of potable water that we consume everyday plays a vital role in maintaining a healthy body. Water aids digestion of food, improves blood circulation and helps in maintaining the body temperature. It helps in

the nutrient absorption and also promotes weight loss by draining out by-products of fat decomposition. Drinking contaminated water can result in severe illness. Hence, it is important to ensure the potability of water. The ground water quality at different locations of Chittoor and its suburb mandals, Andhrapradesh, has been analyzed to study its impact on human health. Ground water samples from bore wells in the selected areas of Chittoor and suburb mandals were collected and analyzed for physical and chemical parameters such as Turbidity, pH, Hardness, Alkalinity, Calcium, Nitrates, Chlorides, Sulphates, Iron, Electrical conductivity, Total dissolved solids (TDS) and Dissolved oxygen (DO). The results were compared with the World Health Organisation (WHO) and Central Pollution Control Board (CPCB) water quality standards. The studies revealed that ground water of some of the areas were not suitable for drinking purpose and needs purification before drinking.

Key words

Water quality,Human health, DO, Nitrates, Sulphates, CPCB

Effect of Marine Pollution

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Abstract

The over abundance of pollution has a variety of consequences. One of these is excess nitrogen and phosphorous. Although plants require these to grow too high a concentration can cause algal blooms, in which algae overrun the ecosystem. Once these organisms start to sink and decompose, oxygen is depleted. Dead zones are created because marine life cannot survive in that environment. Fish and other forms of life that can swim away leave; other species that cannot move die off. Human being in habiting the land today increasing depending on the ocean for various recourses like food, minerals, oil & gas. About 70% of oxygen needed by organisms is generated by marine plants and those play an important role in oxygen and corbondioxide cycle. Air pollution is also a contributing factor by carrying off pesticides or dirt into the ocean. Land and air pollution have proven to be harmful to marine life and its habitats. The pollution often comes from nonpoint sources such as agricultural runoff, wind-blown debris, and dust.

Importance of Industrial Chemistry

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Abstract
The importance of industrial Chemistry is a challenging and interesting subject for academic study. Its principles and ideas are used to produce the chemicals from which all manner of materials and eventually consumer products are manufactured. Industrial Chemistry is the branch of chemistry which applies physical and chemical processes towards the transformation of raw materials into products that are of benefit to humanity. The goal of the Bachelor of Science in Industrial Chemistry degree programme is to produce graduates who will be highly skilled in this activity. We do this by first giving the students a strong foundation in chemistry, mathematics and physics. The Industrial Chemistry graduate is a chemist with knowledge linkages in engineering, chemical processing, economics and industrial management. Continuous Processes it is crucial for the petrochemical and bulk chemical industry that continuous processing facilities operate with maximum reliability and efficiency. Only highly available plants ensure competitiveness. Reduction in costs, Greater production flexibility, More efficient processes, Increased plant availability. In the highly competitive market environment of the chemical industry, only one thing counts: competitiveness.

Toxic Effects of Water Pollution

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Abstract

Water pollution is the contamination of water bodies is only as a result of human activities water bodies include for ex:lakes,rivers,oceans aquifers and ground water.water pollution results when contaminates are introduce into the natural environment.for ex: Releasing inadequately treated waste water into natural waterbodies can lead to degradation of aquatic ecosystems. Natural phenomena such as volcanes, algaebloms, stroms &earth quakes.water pollution can be grouped into surface water pollution. Marine pollution and nutrient pollution are subsets of water pollution. Six major sources of water pollution such as domestic effluents, industrial effluents, agricultural effluents, radioactive wastes, thermal pollution and oil pollution.

An Overview on Water Recycling Process

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Abstract

Water is one of the key reasons for human survival and civilization in general. Water is considered to be the most important factor behind existence of life on earth. Water carries out many important jobs such as flushing bacteria out of bladder. It is in the form of rivers, lakes waterfalls, oceans and rains and the whole cycle is repeated. Different types of water purification methods are used such as Distillation, Ion exchange, Carbon absorption. Distillation: It is the oldest known method for water purification. In this method water is heated to reach the boiling temperature which makes the vapours rise to a condenser. The cooling water lowers the boiling temperature so that the vapour is collected and stored after being condensed. Ion exchange: The method is given the name because ions are exchanged with the replacement ions which are fixed to the beds. Deionization beds exchange ions either with the cations. Softening process is actually a pre treatment which is intended for lessening the hardness of water before applying the reverse osmosis process. Carbon absorption: It is a popular techinique used for domestic drinking water filter treatment which is due to its ability to purify water by eliminating it from degrading odour and colour, including chlorine as well. Carbon plays a good role in removing gases and chemicals from water and it is also useful against the micro organism.

The Environmental Chemistry

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Abstract

Environmental chemistry is the scientific study of chemical & biochemical phenomena that occur in natural places. Environmental chemistry is a study of chemical process occurring in the environments which are impacted by human kind's activities. These impacts may be felt on a local scale, through the presence of urban cities air pollutants are toxic substances arising from a chemical waste site, or on a global scale, through depletion of stratospheric ozone or global warming. Environmental chemistry involves first understanding how the uncontaminated environment works, which chemicals in what concentrations are present naturally, and with what effects. Environmental chemists advise on the movement and outcome of contaminants in soil and groundwater, assess long-term risks to ecological and human health, apply for environmental permits to undertake corrective strategies, classify

contaminated soils as hazardous waste and manage their disposal, and supervise onsite remediation. In addition to working in the field, they may also conduct laboratory work. For example, they may analyze chemical interactions or relationships using chromatography or spectroscopy techniques. They may also take measurements, interpret data, and use computers to model chemical fate and transport. Environmental chemists may also write reports or academic papers to communicate their findings to clients or colleagues.

The Society of Environmental Toxicology and Chemistry (SETAC) is a global professional organization that actively balances its focus among its academic, business, and government members. It develops and promotes multidisciplinary approaches to solving environmental problems, and provides a forum for sharing ideas.

Optical and Photocatalytic Activity of Nd Doped Binary Oxide Semiconducting Nanoparticles

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Abstract

In recent years, nanosemiconductor photocatalysts have attracted increasing attention. Among the various semiconductor binary oxide semiconducting nanoparticles (ZnO/CdO) photocatalysts looks very promising in removing dye from pollutant water. Undoped and Nd (2 at.%) doped binary oxide nanoparticles (ZnO/CdO) were synthesized by chemical co-precipitation method from their respective acetate with PVP capping agent at 80 ◦C. As prepared samples were annealed under normal air condition at 350 ◦C. The prepared samples were characterized by different techniques. X-ray diffraction (XRD) confirmed the wurtzite and cubical phases of ZnO and CdO respectively. Transmission electron microscopy (TEM) micrographs depict the spherical shaped nanoparticles with average size in the range of 25-35 nm. The optical band gaps were estimated from UV-visible spectroscopy. The calculated band gap values are 3.316, 3.254, 2.457 and 2.342 eV corresponding to undoped and Nd doped (2 at.%) doped ZnO/CdO nanoparticles. The photocatalytic activity of undoped and Nd doped ZnO/CdO was tested by the degradation of methylene blue (MB). The studies show

that the Nd dopant plays crucial role in enhancingthe photocatalytic activity of the ZnO/CdO nanoparticles. Among all of the samples, Nd doped CdO nanoparticles exhibited the best photocatalytic activity under normal sunlight illumination due to size dependent band gap of nanoparticles.

Keywords

Nd doped ZnO/CdO nanoparticles; XRD; TEM; Optical band gap; Photocatalytic activity;

Bryophytes are Reliable Indicators and Monitors of Air Pollution

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Abstract

Bryophyte proves to be a potential bio-indicator of air pollution. The habitat diversity, structural simplicity, totipotency, rapid rate of multiplication and high metal accumulation capacity make bryophytes an ideal organism for pollution studies. The decline and absence of bryophyte populations especially epiphytes is a phenomenon primarily induced by air pollution caused by gaseous and particulate pollutants. Bryophytesare reliable indicators and monitors of air pollution as they are easy to handle and show a vast range of specific sensitivity and visible symptoms to pollutants greatly exceeding that of higher plants.

Key Words

Bryophyte, bio-indicator, air pollution, pollutants.

Phytoremediation : Herbal world opens door for Environmental Pollutant Remediation

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Abstract

Environmental pollution is of serious concern today which is depriving the world of clean water clean air and fertile soil. Heavy metals in environment pose big threat to both human health and natural environment. In developing countries like India, China, Pakistan,

Bangladesh etc soil and water pollution is very severe due to untreated effluents from industrial units. The best source to overcome this situation by cleaning up contaminated environment is the plant. The research on this concept of phytoremediation dates back to 300 years. Plants like Salix viminalis, Salix fragilis are reported for phytoremidiation of Cd, Cu, Pb, Zn, Ricinus communis accumulates Cd, Zea mays accumulates Cd, Pd, Zn. This study aims to assess the extent of metal accumulation by plants. It also investigates to find suitable plants for phytoextraction and phytostabilization. The study also emphasized that native plant species growing on contaminated sites may have the potential for phytoremediation. The leaves, bark, wood of this plant are the best accumulators of pollutants which play an important role in phytoremediation. Using plants to remediate heavy metal pollution is an effective technique in pollution control. Phytoremediation which makes use of vegetation to remove, detoxify or stabilize persistant pollution is a safer, cheaper, green and environmental friendly tool for cleaning polluted air, soil and water. This search for novel bioaccumulator plants is going on.

Key words

Vallaris solanacea, glycosides, phytoremediation, accumulators, pollutants.

A Simple spectrophotometric method for the determination of Arsenic in industrial and environmental samples using 5-methylthiophene – 2-carboxaldehyde ethylenediamine (MTCED)

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Abstract

5-Methylthiophene– 2-Carboxaldehyde Ethylene diamine (MTCED) has been proposed as new analytical reagent for the direct non-extractive spectrophotometric determination of Arsenic. The reagent reacts with arsenic in acidic medium (pH 4.0, Sodium acetate- acetic acid buffer) to form light greenish yellow colored 1:1 (M:L). The colour reactions are instaneous and the maximum absorbance was obtained at 395 nm and remains constant for over 5 h. The molar absorptivity and Sandell's sensitivity of MTCED found to be 5.99 x 10^4 L $mol^{-1}cm^{-1}$ and 0.0016 µgcm^{-2} of As (III) respectively. The system obeys Beer's law in the range of 0.129 - 2.668 µg/ml of As (III). Since MTCED method is more sensitive it was applied for determination of Arsenic in some environmental water samples.

Key words

Spectrophotometry, Arsenic determination, MTCED, Environmental samples.

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Properties of Green Solvents and their applications in Organic Synthesis

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Abstract

Green chemistry strongly influences chemicalresearch, and there is still a big challenge respectingthe requirement to use 'greener' reaction conditions.An important aspect of this field is the replacementof conventional solvents by non-flammable, nonvolatile,non-toxic and inexpensive "green solvents". The properties of green solvents such as phase behavior and intermolecular interactions, colloid and interphase science of green solvent systems, chemical thermodynamics, microstructures, C-C bond formation reactions and functions etc., these green solvents can recommend as relatively environmentally benign in comparison to the current use of conventional solvents are supposed to replace in organic synthesis. Thus due to the interesting physical properties of green solvents such as Supercritical fluids, Ionic liquids, Supercritical CO_2 and Polyethylene glycols(PEG) are widely used in many organic transformations and in the synthesis of many heterocyclic compounds. Recently PEG is well known solvent media for developing many coupling reactions such as Suzuki, Heck, Stille, Sonogashira and also C-C bond formation reactions, Diels Alder reactions. The current potential properties and applications of Greensolvents these are provided for consideration in organic synthesis of future needs.

Key words

Green solvents, Ionic Liquids, Supercritical Fluids, Polyethylene glycols, C-C bond formation.

Jessops'sstatement: "…A green solvent will only be chosen if one exists with the desired properties."

Equilibrium, isotherms, kinetics, and thermodynamic studies for Congo Red adsorption using Peanut Hull Based Activated Carbon

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Abstract

In this study, the adsorptive removal of Congo Red (CR) from aqueous solution using Peanut Hull Based Activated Carbon (PHBAC) was investigated. The effects of pH (3-10), initial dye concentration (100-500), contact time (0-300 min), adsorbent dosage (0.05-0.4 g) and temperature (298-328 K) were examined. The PHBAC was characterized by Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy (SEM) and Elemental analysis.The kinetic data were evaluated based on the pseudo-first-order, pseudo-second-order and intra-particle diffusion modes to calculate the theoretical CR uptake as a function of time. The adsorption kinetics was followed pseudo-second-order kinetic model. The equilibrium adsorption data was evaluated using Langmuir, Freundlich, Dubinin-Radushkevich and Temkin isotherm. The value of R^2 (correlation coefficient) indicates that the equilibrium data were better fitted to Langmuir isotherm model. The maximum adsorption capacity of CR (198.2 mg/g) was occurred at pH 3.0.The thermodynamic parameters determined at 298, 308, 318 and 328 K revealed that the adsorption occurring was feasible, spontaneous and endothermic in nature. This study indicated that PHBAC as a low-cost adsorbent had a great potential for the removal of CR as an alternative eco-friendly process.

Keywords

Adsorption, Congo red, Peanut hull, Kinetics, Isotherms.

Heavy metal Resistance Probiotics

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Abstract

Heavy metals are metallic elements having a density of over 5 g/cm^3. They are undegradable different forms of inorganic and organic compounds. The discharges of these metals into aquatic ecosystem become a matter of concern in India over the last few decades. Unlike organic contaminants, heavy metals cannot be broken down by chemical or biological processes and can only be transformed into less toxic species. The majorities of heavy metals are toxic at low concentrations and are capable of entering the food chain, where they

accumulate and inflict damage to culturing species in aquaculture ponds. Probiotics are living microorganisms which confer beneficial effects on the hosts. Now a days there is documented evidence that probiotics can improve water quality by increasing the tolerance to heavy metal. Currently there are various microbial species are used as probiotics such as Bacillus sp., Lactobacillus sp., Enterococcus sp., Carnobacterium sp and Bifido bacteria etc. This present work provides the basic information regarding the use of different probiotic bacteria in removal of different heavy metals from aquaculture ponds.

Key words

Heavy metals, Probiotic bacteria, Lactobacillus sp.,

Challenges And Opportunities Associated With Waste Management In India

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Abstract

India faces major environmental challenges associated with waste generation and inadequate waste collection, transport, treatment and disposal. Current systems in India cannot cope with the volumes of waste generated by an increasing urban population, and these impacts on the environment and public health. Waste dumps have adverse impacts on the environment and public health. Open dumps release methane from decomposition of biodegradable waste under anaerobic conditions. Methane causes fires and explosions and is a major contributor to global warming. There are also problems associated with odour and migration of leachates to receiving waters. Odour is a serious problem, particularly during the summer when average temperatures in India can exceed 45°C. Discarded tyres at dumps collect water, allowing mosquitoes to breed, increasing the risk of diseases such as malaria, dengue and West Nile fever. Uncontrolled burning of waste at dump sites releases fine particles which are a major cause of respiratory disease and cause smog. The impacts of poor waste management on public health are well documented, with increased incidences of nose and throat infections, breathing difficulties, inflammation, bacterial infections, anaemia, reduced immunity, allergies, asthma and other infections.

The challenges and barriers are significant, but so are the opportunities. A priority is to move from reliance on waste dumps that offer no environmental protection, to waste management systems that retain useful resources within the economy. Waste segregation at source and use of specialized waste processing facilities to separate recyclable materials has a key role. Disposal of residual waste after extraction of material resources needs engineered

landfill sites and/or investment in waste-to-energy facilities. The potential for energy generation from landfill via methane extraction or thermal treatment is a major opportunity, but a key barrier is the shortage of qualified engineers and environmental professionals with the experience to deliver improved waste management systems in India. In this paper I am going to explain about the waste collection, transport, its effect on public health and waste management techniques in India in detail.

Keywords

population growth, public health, waste management

How do biological Stimuli modulate amphiphilicity of a thermoresponsive polymer?

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Abstract

Comprehensive knowledge of the biomolecular interactions between thermoresponsive polymers (TRPs) and proteins are necessary to fabricate potential materials for various bio-related science and technology applications. Although over the past four decades have evidenced that tremendous growth in the utilization of TRPs in the addition of various stimuli systems, a underlying molecular origins of the role of biological stimuli on TRPs phase transition is still missing. In this regard, we demonstrated the comparative effect of heme proteins (biological stimuli) such as cytochrome c (Cyt c) and myoglobin (Mb) on the phase behaviour of poly(N-isopropylacrylamide) (PNIPAM) aqueous solution. The sophisticated multiple techniques have confirmed that the structural integrity of the proteins is found to play a vital role in altering the phase transition temperature of PNIPAM to different extents with increasing the concentration of proteins. With the addition of Cyt c, the lower critical solution temperature (LCST) of PNIPAM (33.0 ^{0}C) increased towards higher temperature (35.7 ^{0}C) in contrast to this with the addition of Mb the LCST of PNIPAM decreased towards lower temperature (30.7 ^{0}C). This discrepancy is due to the difference in contrast structural arrangements of both proteins on the LCST of PNIPAM. On the basis of these results, the variation in the structures of both heme proteins, hydration and dehydration between the heme proteins are compared. These results demonstrated that depending on the type of smart polymers used for bio-related applications, it is necessary to take into account the effect of biological stimuli while designing polymers.

Keywords

Biomolecular interactions, Thermoresponsive Polymer, Biological Stimuli, lower critical solution temperature

Green approach towards the facile synthesis of pyrano[2,3-d]pyrimidine derivatives and their biological evaluation

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Abstract

A simple and efficient one pot synthesis of heteroaryl substitituted pyrano[2,3-d]pyrimidines has been developed via initial Knoevenagel, subsequent Micheal and final heterocyclization reactions of heteroaryl aldehyde, malononitrile and barbituric acid/dimedone using ionic liquid triethyl ammonium acetate (TEAA) as a catalyst as well as a green and reusable solvent. Short reaction time, environment friendly procedure, reusability and excellent yields are the main advantages of this procedure. All synthesized compounds have shown good antimicrobial activity against different microbial stains.

Keywords

Green Synthesis, Pyrano Pyrimidine Derivatives, Tri Ethyl Ammonium Acetate.

Microwave assisted Solvent-free Synthesis of Dihydropyrimidinones/Thiones catalyzed by Amberlyst® 15 DRY/TBAB

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Abstract

A simple, efficient and practical procedure for the Biginelli reaction using Amberlyst® 15 DRY/TBAB combination as a novel acid catalyst is described under microwave assisted solvent-free conditions. The catalyst exhibited remarkable reactivity. The method offers several advantages including high yields, environmentally friendly procedure, short reaction times and simple work up procedure.

Keywords

Microwave assisted synthesis, Dihydropyrimidinones, Amberlyst 15 DRY, Heterogeneous Catalysis.

Antibacterial activity of some of the isolated compounds from the fruit rinds of Punica granatum

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Abstract

Phytochemical investigation of the methanolic extract of pomegranate fruit showed following antibacterial activity directed isolation led to the isolation of 2-(4-methoxy-2-methylphenyl)-chroman-3,4-diol and digallic acid. Both the compounds exhibited substantial activity against species of E. coli, P. aureginosa, S. marcescens, S. typhimurium, S. flexneri, B. cerius, Bsubtilis and S. aureus. However, both the compounds were more active against gram-positive and gram negative bacteria. On comparing the activity of both the isolated pure compounds, it was found that digallic acid showed the highest antibacterial activity against all the tested sensitive strains and the activity of the remaining pure one compound was almost same due to the structural similarities of the compounds. The reason for antibacterial activity of both pure compounds was attributed to their phenolic structure.

Keywords

Phytochemical investigation, methanolic extract, pomegranate fruit, antibacterial activity, 2-(4-methoxy-2-methylphenyl)-chroman-3,4-diol, digallic acid, E. coli, P. aureginosa, S. marcescens, S. typhimurium, S. flexneri, B. cerius, B. subtilis, S. aureus, gram-positive and gram-negative bacteria.

Green synthesis of silver nanoparticles using Alnus firma leaf extract exhibits antibacterial activities

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Abstract

Green synthesis of nanoparticles is one of the challenging issues in nanoscience research. In this study green synthesis of silver nanoparticles (AgNP's) using aqueous leaf extract of Alnus firma as a Ag^+ ions reducing agent from silver nitrate solution has been investigated. The synthesized particles were characterized by using, TEM, XRD, SEM-EDS, FTIR, and UV-vis spectrum. The prepared AfAgNPs, spherical in shape and the size range of the particles was 18 to 100 nm. The antibacterial activity of the silver nanoparticles was evaluated by minimal inhibitory concentration (MIC) method.

Keywords

Alnus firma, Leaf extract, Antibacterial activity, MIC assay, Silver nanoparticles.

Soil Pollution near a Municipal Solid Waste Disposal Site

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Abstract

The Municipal Solid Waste disposal site in India has become an overflowing landfill because of the indiscriminate dumping of solid waste at the site. Gas and leachate generation are inevitable consequences of practice of solid waste disposal in landfills. The migration of gas and leachate away from the landfill boundaries present serious environmental concerns which include, and are not limited to, fires and explosions, vegetation damage, unpleasant odour, landfill settlement, ground water pollution, soil pollution and global warming. Leachate and soil samples were collected from this landfill-site and its adjacent area to study the possible

impact of leachate percolation on soil quality. Concentration of various physicochemical parameters and engineering properties were determined in soil samples. Conductivity and compaction characteristics of soil were studied. The study indicated that leachate can modify the soil properties and significantly alter the behavior of soil.

Keywords

Municipal Solid Waste, Leachate, Landfill, Global warming.

The Cadmium (Cd) toxicity levels and depletion of total carbohydrates and lipids in Portunussanguinolentus (marine crab), and effects of public health

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Abstract

Marine aquatic life is the one the main source of food for human beings and as well drinking water source also for Gulf and Mediterranean countries. Visakhapatnam coast is a natural beauty and it has a wide range of marine resources. Since 1940's it has been depleting natural quality of organ profiles as well ecosystem. Because it has exposed to heavy urbanization and industrial pollution. In this research article, the author has observed the seasonal variation of cadmium levels (water & crab), total carbohydrates and lipid levels in Portunussanguinolentus (marine crab). The result was followed respectively in this research study. The author was chosen elven different sampling stations along with Visakhapatnam coast, which is namely Pollution Left Wing (PLW1 to PLW5), Main Pollution Source (MPS) and Pollution Right Wing (PRW1 to PRW5). The samples were collected each station water and marine crab samples to determine for cadmium and lipid levels respectively.

The resulting trend of cadmium (Cd) and lipid levels were found as follows in the 11 selected experimental sites in the marine water of Visakhapatnam coast in different seasons like premonsoon, monsoon and postmonsoon. The Cadmium was found to be high 0.0460 (±0.0045) µg/ml and 0.1383 (±0.0177) µg/g respectively water and crab tissue at MPS in all three seasons among all sites. Similarly, the author has noticed to carbohydrates and lipid levels in the same study, high depletion was found respectively 5.208 (±1.8953) and 30.128 (±3.8975) mg/g of in MPS in all three seasons among all sites.

However, the Cd concentration in marine water was found to exceed limits according to Indian standards in monsoon and postmonsoon at all sites but in premonsoon at MPS and PLW5 in marine water. Cd concentrations in the marine crab and water were found to be very high in two seasons (monsoon and post-monsoon) at MPS, PLW4, PLW5 and PRW5. Which

due to various industrial urban and agricultural activities, which has been discharged heavy metals waste, effluents and as well runoff into the coast water. The author was another hand the marine crab metabolic carbohydrates and lipids depleted according to Cd high concentration presents in water and crab tissue. Which due to toxic Cd could be accumulated in marine crab through the food chain as well osmosis process of water and body flues of crab. This bioaccumulation process could be a path to a human being through the food chain. Cadmium accumulates in the human body and especially in the kidneys damage (renal tubular damage) and both human and animal studies indicate that skeletal damage (osteoporosis).

The Three Bin Solution In India

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Abstract

The objectives of writing this paper are to study the current practices related to the various waste management initiatives taken in India for human wellbeing. The other purpose is to provide some suggestions and recommendations to improve the waste management practices in Indian towns. This paper is based on secondary research. Existing reports related to waste management and recommendations of planners/NGOs/consultants/government accountability agencies/key industry experts/ for improving the system are studied. It offers deep knowledge about the various waste management initiatives in India and find out the scope for improvement in the management of waste for the welfare of the society. The paper attempts to understand the important role played by the formal sector engaged in waste management in our country. This work is original and could be further extended.

Keywords

India, Recycling, Waste Disposal, Waste Management

Marine Pollution

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Abstract

Definition:- **“** The Continued degradation of the human environment has become a major contemporary problem in all parts of the world. The major components of environment are air, water, and soil. Sea water which covers about 2/3 of the planet play a vital role in maintaining the fundamental biological and ecological balance causes of marine pollution**”.**

Introduction:- The knowledge of the various factors influencing the suitability of marine environment is of significance for marine operative. Soil and water are the major

components of the environment and an equilibrium is to be maintained between these two components. Water is of vital importance for the existence of life and is met from either precipitation or ground water, these two are the major sources of water. Dissolved substances are absent in pure water and that water is unable to support life. But fresh internal marine waters are enriched with various substances which come either from soil or from atmosphere. Again the amount of substances in them depends on the geological formations and on various physic-chemical factors of the environment. Heat and light are the essential requirements for the existence and growth of organisms. Solar radiation, turbidity and chemical factors are the other elements that influence the water environment. Besides these elements, the reaction of water also influences various chemical and biochemical processes of living things.

The wave of the environmental consciousness is being spread in India and all over the world. One of the major types of environmental pollution is marine pollution; it has adverse effects on human beings, on the animals that live in and around the sea and in the environment.

The common man understands pollutant as a non-living, man-made substance which accumulates in a particular area causing threat to the human activities. Marine pollution is caused by man, directly or indirectly resulting in harmful effects to living things and even to man.

keywords

Toxic organic and inorganic materials, acids and bases, Petroleum, sediments, solid wastes, heat, radioactive materials, nutrients, pathogens.

E-Waste Management In India

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Abstract

The problem of E-waste has forced Environmental agencies of many countries to innovate, develop and adopt environmentally sound options and strategies for E-waste management, with a view to mitigate and control the ever-growing threat of E-waste to the environment and human health. E-waste management is given the top priority in many developed countries, but in rapid developing countries like India, it is difficult to completely adopt or replicate the E-waste management system in developed countries due to many country specific issues viz. socio-economic conditions, lack of infrastructure, absence of appropriate legislations for E-waste, approach and commitments of the concerned, etc. This paper presents a review and assessment of the E-waste management system of developed as well as developing countries with a special emphasis on Switzerland, which is the first country in the world to have established and implemented a formal E-waste management system and has recycled 11 kg/capita of WEEE against the target of 4 kg/capita set by EU. And based on the discussions of various approaches, laws, legislations, practices of different countries, a road

map for the development of sustainable and effective E-waste management system in India for ensuring environment, as well as, occupational safety and health, is proposed.

Keywords

Extended Producer Responsibility, Advance Recycling Fee, E- waste

Alternatives and Opportunities of Solid Waste Management

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Abstract

Municipal solid waste (MSW) is one of the major areas of concern all over the world. In developing country like India, there is rapid increase in municipal solid waste due to urbanization and population growth. Composition of waste varies with different factors like living standard, climatic condition, socio-economic factor etc. Municipal solid waste (MSW) encompass household compost and trash, street sweeping, construction and destruction rubbish, sanitation residues, trade and non-hazardous industrial refuse and treated bio-medical solid waste . Municipal solid waste management includes collection, storage, transportation and disposal of solid waste. Poor collection and inadequate transportation leads to heap of MSW at many places, which causes health and environmental problems. Governments world over are making efforts to improve solid waste management in their respective countries. Solid waste management is given low priority and budget, which make decision-making process slow. It has become more difficult due to lack of awareness of the rules and regulations, as well as environmental concerns with poor resources, have created a hectic situation

As per the World Bank estimates urban India produces approximately 100,000 metric tons of MSW daily or approximately 35 million metric tons of MSW annually by the year 2000. This paper gives current scenario of India with respect to municipal solid waste quantity, quality and its management.

Keywords
Municipal solid waste, population growth, environment, waste management.

Molecular imprinting: an emerging technique for monitoring marine pollution

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Abstract

Pollution of the marine environment is of global concern because biomagnification of the pollutants into higher trophic levels across the food chains is increasing at an alarming rate. To name few, PCBs in deep sea fish, in whales and seals in oceanic waters and in polar beers and seabirds in the Arctic. Thus it is quite obvious that the impact of the highly toxic and persistent pollutants on the marine ecosystem could be pronounced in terms of their biological responses in organisms and thus it has become highly pertinent to carry out a rapid assessment of their deleterious effects on the ecosystem. In this context, use of biomarkers measured at the molecular and cellular level is of immense importance as sensitive 'early warning' tools for biological effect measurement. Further, to meet the need for improved assessment of ecosystem change over appropriate temporal and spatial scales, new measurement strategies based on continuous or semi-continuous observations are required. However, sensors for temperature, conductivity, depth and turbidity have already been used in oceanography, but it is time that the measurement of chemical and biological parameters is enhanced to accommodate the required decentralised and high frequency observations. The way in which novel instrumentation such as biosensors could contribute to these measurements is the subject of this study.

One of the critical requirements in the development of marine biosensors is their robustness. Antibodies, enzymes and receptors can suffer from lack of stability. One of the emerging techniques, offering some advantages with respect to receptor stability is molecular imprinting. Molecular imprinting (MIP) is a generic technology, which introduces recognition properties into synthetic polymers using appropriate templates. The typical recipe for MIP preparation includes mixing together the target compound (template) with a corresponding functional monomer (methacrylic acid) and cross-linker (ethylene glycol dimethacrylate) in appropriate solvents (chloroform/acetonitrile) and polymerising this mixture using UV or chemical initiation. Subsequent removal of the template leaves binding sites in the polymer with geometry and orientation of functional groups complementary to these of the template molecule and capable of molecular recognition in a manner similar to natural receptors. More than 400 templates have been used successfully for the preparation of MIPs with examples ranging from inorganic ions, peptides and proteins, drugs, steroids and whole cells. Potential frontrunner candidates with the highest level of readiness for

commercialisation are sensors for polycyclic hydrocarbons, pesticides, organophosphate pesticides and chloroaromatic acids. MIPs have a number of advantages in comparison with natural biomolecules. Stable at low/high pHs, pressure and temperature over long time intervals, inexpensive and easy to prepare, no need for animal use/experimentation and can be produced even for analytes where the biological target is not yet known.

Important feature of marine pollution monitoring is that the associated concentrations of pollutants are frequently very low, micromolar to nanomolar or even less. Therefore sensors have to be optimised not only for excellent stability but also for high sensitivity. Where this sensitivity cannot be achieved in a primary system, sample enrichment methods have to be considered. Work is in progress at CEFAS on the development of an automated in situ solid-phase-extraction instrument, which has the potential to be a modular addition to any sensor system for pollutants. With further progress in polymer science and engineering these problems will be solved and we might expect to see the appearance of a new generation of MIP sensors for monitoring marine pollution.

Keywords

Biosensors, Chemical pollution, Marine pollution, Pollution monitoring

Soil analysis for efficient use of fertilizers and reduction of Environmental Pollution in pidugurallamandal,Guntur district, Andhra Pradesh, India

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Abstract

The most important constraint for good crop yield in developing nations worldwide, is soil infertility.The farmers find it extremely difficult to know the proper type of fertilizer, that would match their soil and so they are using the fertilizers without taking into account the requirement of the crops and the characteristics of the soil.Current soil management strategies are mainly dependent on inorganic chemical-based fertilizers, which cause a serious threat to human health.Therefore, for maintaining soil quality andreducing the environmental pollution, soil analysis provides efficient means of soil management .soil analysis ensures that mineral elements donot become deficient or toxic to plants.The present paper is about the soil analysis of PidugurallaMandal, Guntur district, Andhra Pradesh, India which was carried

out for the determination of nitrogen (N), phosphorus (P), and potassium (K), pH and Organic Carbon.The basic objective of this soil-testing is to give farmers a service leading to better and more economic use of fertilizers and better soil management practices for increasing agricultural production and reduction of environmental pollution.

keywords

Soil infertility, chemical based fertilizers,environmental pollution, soil analysis, efficient soil management.

Degradation of Oxifluorfen in different soils and Effect on soil Microflora Carbon and Nitrogen transformation

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Abstract

Soil persistence study was conducted at IIBAT field Loamy sand, Sandy loam, Sandy clay andClay soil.The herbicide was applied on the moist soil plots @50 g a.i/ha recommended(T1-Dose) dose and - 100 g a.i/ha double (T2 Dose).The field experiment plots were laid in Randomized Block Design (RBD) with three replications for each treatment. Untreated control soil plots were also maintained for comparison. The soil samples were collected from 0-15 cm depth 2 h after the application (0th day) and continued the sampling on different occasions 1st, 3rd, 5th, 7th,10th,15thday and 20thday after spraying. The soil samples were extracted and analyzed for the residues of Oxifluorfen by a validatedHPLC-DAD. The soil recovery showed Oxifluorfen 89 ± 2.52% to 94± 1.05% at limit of quantification (LOQ),0.01 µg/g(LOQ), 0.1µg/g(LOQx10),0.5µg/g(LOQx50). The half-life of Oxifluorfen in Loamy sand soil T1 dose 6.05 days and 6.12 days T2 dose rate, Sandy loam soil T1 dose 6.03 days and 6.11 days T2 dose rate, sandy clay soil T1 dose 6.16 days and 6.37 days T2 dose rate and clay soil T1 dose 6.22 days and 6.30 days T2 dose rate. At20th day the residues of oxyfluorfenin the T1 and T2 tested dose had dissipated to below determination level.

Effect of soil microflora on Oxifluorfen was investigated in loamy sand soil under laboratory condition. Oxifluorfen was incubated in loamy sand soil over a period of 28 days for carbon transformation and nitrogen transformation test. Thisstudy was conducted as per OECD 216 and 217Guidelines. The concentrations are T1-50 g a.i/ha and T5-250g a.i/ha soil dry weight.The concentrations tested were based on one and five times the recommended field application.The 0th day samples were collected within the 6hours after the application and continued the sampling occasions 7th, 14th,21stday and 28th day after spraying. The deviation in soil nitrate content determined at 28 days after application of the test item to soil compared to the control was -6.08% and 3.51% for the single and five times test

concentrations. Nitrogen turnover was measured as the soil content of nitrate-N levels in the soil.There is no significant variation between the treatment groups and control sample. The deviation in soil carbon content determined at 28 days after application of the test item to soil compared to the control was 2.6% and 6.6% for the single and five times test concentrations. There is no significant variation between the treatment groups and control sample.

Key Words
HPLC, Loamy sand, Sandy loam, Sandy clay and Clay, Carbon and Nitrogen.

Waste Management Methods And Practices For Environmental Protection

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Abstract

Both wastes and the crude disposal techniques have created subtle and yet serious environmental pollution havoc in many developing countries. This has lead to the degradation of abiotic and biotic components of these nations ecological systems. Poor industrial waste disposal systems as well as the indiscriminate and inappropriate domestic litter disposal habit have been identified and proved to be basic features in rural settlements, semi-urban areas and urban centers of the developing world. These have seriously contributed to environmental pollution and ecological deterioration. The major reasons for these were identified to be inadequate information and insufficient modern waste disposal facilities. It is important to observe sustainability in this aspect so that every bit of waste can be managed in an efficient manner rather than just dumping it all in landfills. *Waste management or Waste disposal is all the activities and actions required to manage waste from its inception to its final disposal. This includes amongst other things, collection, transport, treatment and disposal of waste together with monitoring and regulation. It also encompasses the legal and regulatory framework that relates to waste management encompassing guidance on recycling etc. The present paper is an attempt to state various ways and methods of managing waste like Recycle, Reuse,* **Taking Special Care Of Hazardous Waste, Employ Waste for protection of the environment from pollution.**

Key words

Environment and Waste Management.

Environmental Pollution: Need of Environmental Education

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A healthy natural environment is the fundamental prerequisite for sustainable human development and survival. The uncontrolled growth of urbanization, industrialization, destruction of forests and indiscriminate disposal of waste are leading o the environmental degradation in India. India has been ranked as seventh most environmentally hazardous country in the world. Environmental Pollution affect highly the human health, food and fresh water supplies will be disrupted, millions of people displaced and disease patterns altered dangerously and unpredictably.The strategies that should be adopted to minimize environmental pollution are protecting atmosphere, combating deforestation, protecting oceans and fresh water , sustainable agriculture and rural development, conservation of biological diversity and environmental education. Environmental education helps to develop the skills and attitudes needed to understand the relationships between human beings, their-cultures and the bio-physical

world. Environmental education is the best strategy to create awareness among the public and sensitize them about consequences of environmental pollution and make them aware of measures to protect the earth.

At this juncture a study has been carried out in Nellore with an objective to know the Knowledge , Attitude and Practice regarding environmental pollution and its protective measures, need of envir students .Randomly selected 50 students were interviewed to gather information about the objectives of the study. The students are having moderate levels of awareness and also found low level of environmental protection practices. The study identified the need to boost up the existing environment-protection initiatives; greater emphasis is needed for environmental education, attitudinal change, public participation, and cost-effective pollution control measures.

Key Words

Environmental pollution, Environmental education, attitude change

A TBET based BODIPY-rhodamine dyad for the ratiometric detection of trivalent metal ions and its application in live cell imaging

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Abstract

A novel fluorescent BODIPY-rhodamine dyad probe that operates based on through bond energy transfer (TBET) phenomenon has been synthesized and its application in the detection of biologically relevant metal ions is explored. Among several metal ions, the probe selectively responds to the addition of triva-lent metal ions (Al^{3+}, Cr^{3+} and Fe^{3+}) through its signature absorbance and fluorescence characteristics and permits their ratiometric detection. The trivalent metal ion detection ability of the probe is unaffected with the presence of other commonly coexistent ions. The probe is highly sensitive and it can detect the trivalent metal ions even at ppb level concentrations. The probe is nontoxic under the experimental conditions, cell permeable and useful for the imaging of Al^{3+}, Cr^{3+} and Fe^{3+} ions present in W138 (normal lung fibroblast) cells

Key Words

BODIPY-rhodamine dyadThrough bond energy transfer
Trivalent metal ions
Ratiometric sensors
Live cell imaging

Synthesis and antibacterial activity of novel (4-fluorophenyl)(4-(naphthalen-2-yl)-6-aryl-2-thioxo-2,3-dihydropyrimidin-1(6H)-yl) methanone Derivatives

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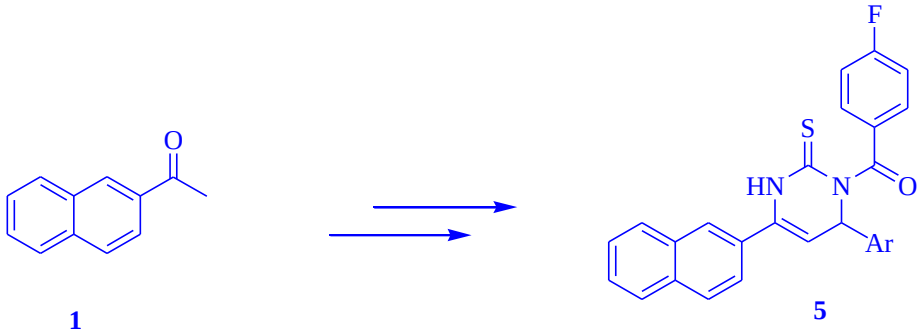
Abstract

Pyrimidine based organic materials represent a significant class of compounds which acquired special attention in heterocyclic chemistry. Pyrimidine occupies an important position in the field of medicinal chemistry due to antibacterial, antifungal, anthelmintic, anticancer and antitumor activity. Naphthalene substituted thiopyrimidine were reported to contain antibacterial activity. In view of these, we aimed the synthesis and bioassay of some

novel pyrimidine-2[1H]-thione derivatives with a naphthyl group, fluoro benzoyl group and with aryl (electron donating and electron withdrawing groups) as substituents. The antimicrobial activities of these target compounds were evaluated.

A novel series of (4-fluorophenyl) (4-(naphthalen-2-yl)-6-ary l-2-thioxo-2,3-dihydropyrimidin-1(6H)-yl) methanone derivatives were synthesized from reaction of 6-(naphthalen-2-yl)-4-aryl-3,4-dihydropyrimidine-2(1H)-thione with 4-fluorobenzoylchloride in dichloromethane in the presence of triethyl amine. The synthesized compounds were screened for antibacterial activity against Gram positive bacteria viz Staphylococcus aureus, Listeria monocytogenes and Gram negative bacteria Escherichia coli, Klebsiella pneumonia respectively. Some of the tested compounds showed significant antimicrobial activity.



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Facile fabrication of TiO_2-graphene nanocomposites (TGNCs) for the efficient photocatalytic oxidation of perfluorooctanoic acid (PFOA)

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Abstract

The present work describes the facile synthesis of the TiO_2-graphene nanocomposites (TGNCs) like graphene oxide-TiO_2 (GO-TiO_2) and reduced graphene oxide-TiO_2 (RGO-TiO_2) nanocomposites and their photocatalytic performance studies related to the decomposition of intractable perfluorooctanoic acid (PFOA). More than 90% photocatalytic PFOA decomposition was achieved by the TGNCs (200mg/L), while only 16% of the initial 12 μM PFOA was decomposed by the commercial TiO_2 highlighting the important role

played by GO and RGO in the nanocomposites. The presence of graphene provided surface enhancement effects and limited the recombination of electron-hole pairs during the photocatalytic decomposition of PFOA. The effect of quenching agents, isopropyl alcohol and sodium persulfate, in the photocatalytic system gave insight into understanding the mechanism of decomposition.

Keywords

Photocatalytic treatment, TiO_2, graphene, nanocomposites, decomposition, PFOA

Acknowledgement

One of the authors (YCS) thank the Andhra Pradesh Pollution Control Board (APPCB), Andhra Pradesh for Junior Research Fellowship (APPCB-RF01).

Removal of Pb (II) and Cd (II) from water using Tender palm shoot powder (TPSP) through adsorption

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Abstract

Tender palm shoot powder (TPSP) as low- cost natural adsorbent was investigated for adsorptive removal of Pb(II) and Cd(II) ions from aqueous solution. Study is carried out on the various physico-chemical parameters such as pH, initial metal ion concentration, adsorbent dosage, equilibrium contact time and temperature. The optimum pH for adsorption was found to be 5 for Pb(II) and 6 for Cd(II). Kinetics data were best described by pseudo-second order model. The equilibrium adsorption data was fitted to Langmuir and Freundlich isotherm models for Pb(II) and Cd(II) adsorption respectively. The best interpretation for the equilibrium data was given by the Langmuir isotherm. The maximum adsorption capacity was found to be 140.9 and 166.1 mg/g for PbII) and Cd(II) at pH 5 and 6 respectively at 323 K. The adsorption capacities (Q^0) for individual metal ions in terms of monolayer adsorption were compared with the other reported values. The thermodynamic equilibrium constant and the Gibbs free energy were determined for each system and results indicated the spontaneous nature of the adsorption process. FTIR and SEM studies were carried out to understand the type of functional groups and surface morphology of Tender palm shoot powder respectively.

Glutaraldehyde cross linked Ca-alginate as an Adsorbent for the removal fluoride from aqueous solutions

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Abstract

A novel biosorbent was developed by cross linking an anionic biopolymer, calcium alginate (CA), with glutaraldehyde. The glutaraldehyde cross linked Ca-alginate (GCA) was characterized by FTIR spectra, porosity and surface area analysis. Batch equilibrium and column flow adsorption characteristics of fluoride on to the biosorbent were studied. The effect of pH, agitation time, concentration of adsorbate and amount of adsorbent on the extent of adsorption was investigated. The experimental data were fitted to Langmuir and Freundlich adsorption isotherms. The data were analyzed on the basis of Lagergren pseudo first order, pseudo second order and Weber-Morris intraparticle diffusion models. The maximum monolayer adsorption capacity of GCA sorbent as obtained from Langmuir adsorption isotherm was found to be 73.5 mg/g for fluoride. The χ^2 and SSE analysis, used to correlate the equilibrium isotherm models and kinetics. In addition, breakthrough curves were obtained from column flow experiments. The experimental results demonstrate that GCA beads could be used for defluoridation of drinking water through adsorption.

Key words

Adsorption**,** GCA, Fluoride removal, Modeling, FTIR, SEM

Studies on fluoride removal from water using chitosan based sorbents

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Abstract

A novel biosorbent, chitosan coated calcium alginate (CCCA) was developed by coating chitosan, a naturally and abundantly available cationic biopolymer, on to an anionic biopolymer calcium alginate for the removal of fluoride ion from aqueous solutions. The results were compared with calcium alginate (CA) beads obtained from natural biopolymer

sodium alginate. Further the biosorbents were characterized by FTIR, SEM and TGA techniques and surface area analysis. Defluoridation of water was studied by using the biosorbent under batch equilibrium and column flow experimental conditions. The effect of various process parameters such as pH, contact time, concentration of fluoride and amount of biosorbent was investigated in order to optimize the process. The equilibrium data were used to study the kinetics of defluoridation process such as pseudo first order, pseudo-second order and Weber–Morris intraparticle diffusion models. The data were fitted to Langmuir and Freundlich adsorption isotherms. The column flow adsorption data were utilized to obtain break through curves. The maximum monolayer adsorption of fluoride on CA and CCCA were found to be 37.0 and 99.0 mg/g. The experimental results demonstrated that chitosan coated calcium alginate beads could be used for the defluoridation of drinking water.

Key words

Defluoridation; Adsorption; Chitosan; Characterization; isotherms

Pumpkin seed powder as low- cost natural biosorbent for adsorptive removal of Cu(II) and Cd(II) ions from aqueous solutions

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Abstract

Pumpkin seed powder as low- cost natural adsorbent was investigated for adsorptive removal of Cu(II) and Cd(II) ions from aqueous solution. Various physico-chemical parameters such as pH, initial metal ion concentration, adsorbent dosage, equilibrium contact time and temperature were studied. The optimum pH for adsorption was found to be 5 for Cu(II) and 6 for Cd(II). Kinetics data were best described by pseudo-second order model. The equilibrium adsorption data were fitted to Langmuir and Freundlich isotherm models for Cu(II) and Cd(II) adsorption respectively. The adsorption capacities (Q^0) for individual metal ions in terms of monolayer adsorption were compared with the other reported values. The thermodynamic equilibrium constant and the Gibbs free energy were determined for each system and results indicated the spontaneous nature of the adsorption process. FTIR and SEM studies were carried out to understand the type of functional groups and surface morphology of Pumpkin seed powder respectively.

Key words

Biosorption, Metal ions, Kinetics ,Isotherms, Thermodynamics

Microplastic Marine Pollution and their Effects on Aquatic Organism

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Abstract

Microplastics (plastic pieces which are smaller or equal to 5 mm size) are proving to be major problem in marine pollution. Primary microplastics include microbeads used in cosmetics, toothpastes, air blasting technology and biomedical research. Rubber pieces from worn out shoes and tyres of vehicles and microfibers arising from machine washing of synthetic constitute secondary microplastics. All these are eventually washed to water sources and 40% of them cross through the waste water treatment and enter the water bodies i.e. lakes, rivers and oceans. The microplastics are ingested by the aquatic life from sedentary poriferans, holothuroideans to motile mussels, crustaceans, fish and reptiles. Mussels and oysters which filter the water accumulate these microplastics and die owing to various reasons. Fish or ichthyoplankton which feed on aquatic flora and invertebrates, uptake these microplastics and most obvious effects observed are blockage in the digestive system i.e takes 50% less food, double time to digest 95% of the food taken and interference with further feeding mechanisms. Mechanical injuries, ulceration is observed in the intestinal lining due to the irregular shapes of microplastics. Histopathological alterations such as widening of lamina propia, detachment of mucosal epithelium, shortening and swelling of villi, enterocytic vacuolation, increase in number and hyperplasia of goblet cells and disruption of serosa are observed in fish. Soot, cellulose, silicates, crystals and diatoms, pass intestinal mucosa on account of persorption and enter circulatory systems. The ingested microplastics are translocated to liver which led to necrosis, infiltration and lipid droplet accumulation. All these conditions are fatal for fish and increase high mortality. These activities on larger scale disturb the flora and fauna near the harbours and metropolitan cities on coasts, leading to the depletion of some species of primary consumers, thereby causing the indigenous higher animals to become extinct or migrate to different area and disturbing the biodiversity of the places. Hence, microplastic marine pollution is serious threat to the environmental equilibrium.

Environmental Protection and Waste Management

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Abstract

Waste is a material or substance, which is not usable or unwanted or re-usable. Waste is any substance which is discarded after primary use, or is worthless, defective and of no use. Efficient waste management is a matter of international concern and countries have set up robust regulatory waste management regimes for balancing the objectives of development and environment sustainability. 'Solid Waste' means solid or semi-solid domestic waste, commercial waste, sanitary waste, catering and market waste, institutional waste and other non residential wastes, street sweepings, silt removed or collected from the surface drains, agriculture and dairy waste, horticulture waste, treated bio-medical waste excluding industrial waste.

The efficient waste management is to ensure proper segregation of waste at source and to ensure that the waste goes through different streams of recycling and resource recovery. The concept of common waste treatment facility is being widely promoted and accepted as it uses waste as a resource by either using it as a co-fuel or co-raw material in manufacturing processes. The solid waste has way too many sources and each kind requires a different method of collection, treatment and finally disposal.

The waste sources are: 1.**Residential - food waste, etc., 2.Industrial –** packaging, etc., 3.**Commercial Units - usually both residential and industrial, 4.Institutional - from offices, 4.Construction and Demolition waste, 5.Agriculture -** pesticide containers & other products used etc, 6.**Biomedical - waste generated** from hospitals.

The per capita generation of waste is increasing by 1.3% per annum. In urban areas it is increasing between 3% to 3.5% per annum. Annual increase in waste generation is around 5% annually. India produces 42.0 million tons of municipal solid waste annually at present. Per capita generation of waste varies from 200 gm to 600 gm per capita / day. Average of waste generation rate is 0.4 kg per capita per day in 0.1 million plus towns. Collection efficiency is in between 50% to 90% of solid waste generated. Urban Local Bodies (ULBs) spend Rs.500/- to Rs.1500/- per ton on solid waste management of which, 60% to70% of the amount is on collection alone 20% to 30% for transportation.

Present status of Waste Management System: There is no proper planning for waste management while planning the townships in our country. There is no proper institutional set up for waste management and planning and designing in urban local bodies. Technical and trained manpower is very less. Community participation is very poor because of lack of awareness. No expertise and exposure to use modern techniques and best practices for waste management in urban areas. Still sufficient funds and budgetary provisions are not made.

Suggestions: 1. Create awareness on minimisation of waste. 2. Arrangements should be made for recycling of waste. 3. Encourage for transformation of waste. 4. Create sanitary Land-fillings particularly in metro cities. 5. Government should initiate to set up proper mechanism for effective implementation of various laws enacted from time to time for environmental protection. 6. Bio-medical waste should be scientifically managed.

Plastic pollution of the world's seas and oceans as a contemporary challenge in ocean governance

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Abstract

The problem of plastic pollution in the world's seas and oceans has attracted increasing scientific concern[1], with calls for an international agreement to address this issue. Any such agreement would extend, complement, and also challenge existing international, regional, national, sub-national, and local initiatives. Responses to the problem of marine plastic pollution will need to involve and link state and non-state actors, business, and civil society, looking to integrated solutions that move away from traditional state-based, sector-focused responses to oceans' issues. The United Nations Environment Assembly meeting in Nairobi, Kenya, convened in early December 2017 under the auspices of the United Nations Environment Program, was the most recent gathering to address the significant issue of plastic pollution in the world's seas and oceans. The topic was included in one of the 11 resolutions discussed at the meeting, which, although non-binding, are likely catalysts for further action. For the first time, the United Nations Environment Assembly deliberations included the adoption of a Ministerial Declaration by consensus. This declaration noted that annually "we dump [from] 4.8 to 12.7 million tonnes of plastic in oceans". The president of the assembly noted that "the results … will provide us with concrete solutions to achieve our aspirations.

Key words:

Marine plastic pollution, Public awareness, Responsibility of governments.

One-Pot Synthesis Of 2-Substituted Quinazolinones By $Cr(No_3)_3.9H_2O$

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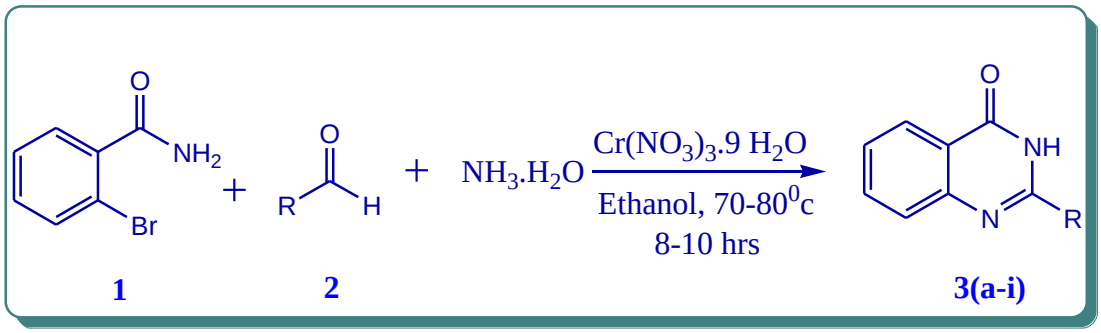
Abstract

The exploration of heterocycles as privileged structures in drug discovery is an important major area in medicinal chemistry. Among them, the quinazolinone ring system is a ubiquitous structural unit and important pharmacophore found in a number of alkaloids and many biologically active compounds. Quinazolinones are prevalent in a wide range of both natural and non-natural products. For example, febrifugine, fumiquinaoline A, luotonin A and (-)-asperlicin have all been found to display noteworthy biological activities including anti-malarial and anti-cancer properties. With a high occurrence of quinazolinone derivatives displaying broad and diverse biological profiles, efficient routes for the synthesis of these heteroaromatic structures has attracted significant attention over many years. In view of their importance, a number of methods for 4(3H)-quinazolinone preparation have been developed.

During the course of our studies on the development of quinazolinones synthesis, we found that $Cr(NO_3)_3.\ 9H_2O$ an inexpensive and commercially available catalyst can efficiently catalyze a one-pot synthesis of 2-substituted-4(3H)-quinazolinones via a three-component condensation of 2-bromobenzamide, benzaldehyde and aqueous ammonia (**Scheme 1**). The products were formed with excellent yields. In our present work, we unzip our results for preparation of Quinazolinone derivatives with high yields which is superior to other methods.

Scheme 1



Synthesis of 2-substituted Quinazolinone derivatives

A series of 2-substituted quinazolinone derivatives have been synthesized in excellent yields. The desired products were isolated in moderate to excellent yields in the presence of $Cr(NO_3)_3.\ 9H_2O$. All the products were identified by spectral (^1H NMR, ^{13}C NMR and mass) and analytical data.

Keywords

2-Substituted Quinazolinone, One-pot reaction, $Cr(NO_3)_3.\ 9H_2O$ ammonia, Aldehydes, Heterocyclic compound.

Air Pollution and its Impact on Vegetative growth of the plants

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Abstract

Air Pollution is one of the primary issues world is confronting today. It declines environmental condition. In the recent past, air pollutants, accountable for vegetation damage and their yield losses, are causing increased concern. Urban air pollution is a major issue in both developing and developed countries. The increasing number of industries and automobile vehicles are continuously adding deadly gases and other elements to the environment. All ignition discharge fumes and particles into the air. These can incorporate sulfur and nitrogen oxides, carbon monoxide and soot particles, as well as smaller quantities or toxic metals, organic molecules and a radioactive isotope. From so many years, there has been a constant progression in the human population, road transportation, vehicular traffic and industries which has resulted in a further increase in the concentration of gaseous and particulate pollutants. Adverse effects of air pollution on biota and ecosystems have been confirmed worldwide. Much experimental work has been conveyed on the examination of air pollutant effects on crops and vegetation at various levels ranging from biochemical to ecosystem levels. It has been recognized that ozone concentrations are higher in suburban and rural areas as compared to the urban areas, whereas SO2 and NO2 concentrations are higher at urban sites. The present review critically describes the impact of air pollution and its constituents on the morphological attributes such as leaf area, leaf number, stomata structure, flowering, growth and reproduction as well as biochemical parameters such as pigment content, enzymes, ascorbic acid, protein, sugar and physiological aspect such as pH and relative water content. Further, the paper provides a brief overview of the impact of on biodiversity and climate change.

Impact of Industrial Wastewater on Biochemical Contents of *Cicer Arietinum L.*

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Abstract

The study aimed to determine the effect of industrial wastewater on germination, growth and chlorophyll content of edible crop plant Cicer arietinum L. in pot culture experiment. The effect of wastewater was compared to that of control (distilled water). Different

concentrations such 0, 25%, 50%, 75% and 100% effluent were used in experiment up to one month period. The results revealed that the effluent drastically affected the germination, shoot, root in length and chlorophyll content at 75 and 100% concentration compare to control. It has been observed that the germination, growth and chlorophyll content of Cicer arietinum L. were more sensitive to industrial wastewater. However, Cicer arietinum L. showed acceptable performance at 25% and 50% effluent concentration.

Key Words

Wastewater, germination, growth, chlorophyll, Cicer arietinum L.

Determination of etilefrine using a poly(-ethyl-3-methylimidazolium methyl sulfate)@Cu Nanowires modified carbon paste electrode

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Abstract

A poly(1-ethyl-3-methylimidazolium methyl sulfate)@Cu Nanowires modified carbon paste electrode based sensor was successfully fabricated by the electropolymerization of 1-ethyl-3-methylimidazolium methyl sulfate (EMIMS) onto the surface of Cu Nanowires modified carbon paste electrode using cyclic voltammetry (CV). The fabricated electrode abbreviated as poly(EMIMS)@CuNWs/CPE and the surface morphology of Cu NWs studied by electron microscopy (FE-SEM and TEM), X-ray diffraction (XRD) and Fourier transform infrared spectroscopy (FT-IR) techniques. The poly(EMIMS)@CuNWs/CPE showed an excellent electrocatalytic activity towards the determination of etilefrine (ET HCl) in 0.1M phosphate buffer solution (PBS) at pH 7.0 The influence of pH, scan rate and concentration of ET HCl is investigated. The poly(EMIMS)@CuNWs/CPE was successfully used as a sensor for the simultaneous determination of ET HCl and paracetamol. The poly(EMIMS)@CuNWs/CPE showed an excellent limit of detection (LOD) 2.3 µM over the linear dynamic range of 0.1 µM to 1.3 µM. The prepared poly(EMIMS)@CuNWs/CPE has exhibited good stability, high sensitivity and low detection limit for the determination of ET HCl. The validity of the advanced method was checked by applying the same for real sample analysis.

Keywords

Copper nanowires, 1-Ethyl-3-methylimidazolium methyl sulfate, Etilefrine HCl, Cyclic voltammetry;

Environmentally Benign Synthesis of Dihydropyrimidin -2-One/Thione Derivatives

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Abstract

Environmental pollution is the biggest challenge of the present era. To promote the environment friendly process, it has been emphasized to use alternate ways of synthesis of the organic compounds. Organic synthesis through microwave irradiation is a new and interesting technique not only avoids environmental pollution but also enhances the rate of the reactions.

Evolution of microwave induced organic synthesis involving environmentally clean protocols has emerged as an area of great interest from both environmental and economical aspects. Environmentally benign method of microwave irradiation have been taken up to carry out the Biginelli reaction for the synthesis of N,N'-disubstituted 3,4-dihydropyrimidin-2-one/thione derivatives. These reactions were performed under solvent free and mild conditions with microwave irradiation as the energy source. The advantages of this novel protocol include enhanced yield, reduced reaction time, operational simplicity and avoidance of organic solvents leading to environment friendly reactions. However, the original Biginelli condensation often suffers from low yields, longer reaction times and strong acidic conditions.. All the synthesized compounds were charecterised by spectral analysis.

Keywords

N,N'-disubstituted 3,4-dihydropyrimidin-2-one/thione derivatives, Biginelli reactions, microwave induced organic synthesis, environmentally clean protocols, eco-friendly reactions, Green chemistry.

Impact of Industrial Effluent on Germination and Seedling Growth of *Capsicum Annuum* L.

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Abstract

The study aimed to determine the effect of industrial waste water on seed germination and seedling growth of some selected crop plant *Capsicum annuum* .L in pot culture experiment. The effect of effluent was compared to that of control (distilled water). Different concentrations such 0, 25%, 50%, 75% and 100% effluent were used in experiment up to one month period. The results revealed that the effluent significantly affected the germination and shoot, root in length at 75 and 100% concentration compare to control. It has been observed that the seed germination and seedling growth of *Capsicum annuum* .L was more sensitive to waste water. However, *Capsicum annuum* .L showed acceptable performance at 25% and 50% effluent concentration.

Key Words

Effluent, germination, *Capsicum annuum* .L

Solid Waste Management

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Abstract

Solid waste management is a major challenge in urban areas throughout the world. Previously considered a local issue, it is now clear that solid waste management has international and global implications. Concern about trans boundary shipment of hazardous waste has led to the adoption of the Basel Convention by the United Nations. Without an effective and efficient solid waste management program, the waste generated from various human activities, both industrial and domestic, can result in health hazards and have a negative impact on the environment. Understanding the waste generated, the availability of resources, and the environmental conditions of a particular society are important to developing an appropriate waste management system. Solid waste is defined as material that no longer has any value to its original owner and is discarded. The main constituents of solid waste in urban areas are organic waste (including kitchen waste and garden trimmings), paper, glass, metals, and plastics. Ash, dust, and street sweepings can also form a significant portion of the waste. Solid waste management may be defined as the discipline associated with controlling the generation, storage, collection, transfer and transport, processing, and disposal of solid waste in a manner that is in accordance with the best principles of health, economics, engineering,

conservation, aesthetics, and other environmental considerations, and that is also responsive to public attitudes.

Environmental Protection – Role of CSR initiatives

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Abstract

Corporate Social Responsibility is a key concept in the business world. In India many industries have modified their policies, activities and are engaged into Corporate Social Responsibility (CSR) especially on environmental care beyond their financial aspects. India is the first country following and implementing CSR regulation in the constitution under the "companies' act.2013, Section 135, clause VII. SPSR Nellore District in Andhra Pradesh has long industrial corridor and at present 110 large, medium and small scale companies are located. Among them 42 companies are doing CSR activities in SPR Nellore District.

In India, after bifurcation the state of Andhra Pradesh is in a big financial crisis and the Govt. of Andhra Pradesh appealing to all the companies to adopt villages for the development of communities. This paper shows the concept of Corporate Social Responsibility with particular emphasis on Environmental care. This study is aimed to find out of the socio-environmental conditions of the people, and to study the CSR initiatives on Environmental Protection in SPSR Nellore district and also suggest the role of social worker in enhancing the awareness levels of community people towards CSR initiatives of the companies and suggest the companies to minimize the environmental harmfulness by their own solutions.

Key Words

Corporate Social Responsibility, Environmental Protection

Environmental Pollution And Health Problems

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Abstract

It is observed in several studies that there is a link between environmental pollution and health problems. According to National Health Profile of India 2018, Infant Mortality rate in rural is 41 and urban 25 per 1000 live births, Disability –adjusted life years (DALYs) are 33%, epidemiological transition of infectious and associated diseases are 43% and non-communicable diseases are 75%.and injuries are 14%.Malaria death rate affects 0.01% per one lakh population. The environmental pollution leads to different kinds of health problems, which result mainly due to water pollution, air pollution and noise pollution.

The major sources of water population are domestic sewage, residences, hotels, institutions, offices etc, industrial waste water viz., pulp and paper industries, distillery, refinery and tannery. The common diseases caused by the water pollution are Typhoid, Dysentery, Hookworm Disease, Jaundice, Poliomyelitis, Pneumonia, influenza, whooping cough etc. And increasing industrial and vehicle emissions such as carbon monoxide, carbon, sulphur and lead are some of the harmful pollutants which lead to rising temperature, ozone depletion resulting in to skin diseases, cancer and breathing problems, byssiosions in textile workers and pneumoconiosis among mine workers. Noise pollution viz.,loud speakers, automobiles, radio- micro phones, air craft's, construction works, trains, which are more than 150 db levels can lead to hearing problem permanently, and the noise of 180 db would fatal to human being. In the present paper, an attempt has been made to focus on the various dimensions of health problems caused by environmental pollution on human life. And it also dwells about the role of social worker in creating awareness about health policies and schemes such as Ayushman Bharath, National Health Protection Mission (2018), Mission Indradhanush full immunization in India by 2020, National Health Policy (2017), National Urban Health Mission (2014), Janani Sishu Suraksha karyakaram (2011), Rashtriya Swasthya Bhima Yojana(2008), and environmental protection with the support of Non-Governmental Organizations (NGO's).

Key Words

Environmental Pollution , Health Problems.

Potential uses of laccases in Bioremediation

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Abstract

Rapid industrialization today has contaminated ecosphere withhazardous chemicals and reactants. Some of these chemicals are persistent in the environment and potential agents of carcinogenic and/or mutagenic effects.Methods of bioremediation offer range of benefits that are difficult to achieve by chemical and incineration methods.The use of enzymes for the removal of environmental and industrial pollutants has attracted increasing attention.Laccase (p-diphenol: dioxygen oxidoreductase) is one of a few enzymescatalyze the monoelectronic oxidation of a broad spectrum of substrates*viz.,*ortho- and para-diphenols, polyphenols, aminophenols, and aromatic or aliphatic amines, coupled with a full, four-electron reduction of O_2 to H_2O. Laccases are common enzymes found widely in plants and fungi as well as in some bacteria and insects.But, the main limitation of using laccases in bioremediation is their detection and purification from diverse substrates. Many fungi*viz*., *Agaricusbisporus*, *Botrytiscinerea*, *Coprinuscinereus, Phlebiaradiata ,Pleurotusostreatus*, and *Trametes versicolor* were reported to produce laccasescapable of degrading lignin. Among potential uses of laccases, they oxidize a broad range of xenobiotic compounds including chlorinated phenolics. Dye industry currently employing Laccases degrading dyes of diverse chemical structure including synthetic dyes.Both nonylphenols and nonylphenolpolyethoxylates which are discharged into the environment, that are resistant to biodegradation are found even after wastewater treatment, have proved to degraded by laccases obtained fromaquatic hyphomycete, *Clavariopsisaquatic.* The uses of laccases have also been studied in biobleaching of pulp and paper industry.The use of laccase in biosensor technology is mainly attributed to its broad substrate range allowing for the detection of a broad range of phenolics. Therefore, that laccase has a great potential application in environment protection. However, much more research is required to make use of laccases to protect environment and other industrial applications.

Keywords

Bioremediation, Laccases, Fungi

Exploration of binding studies of a cyanoacetamide derivative of flavone with acetylcholinesterase using Biophysical and computational approach

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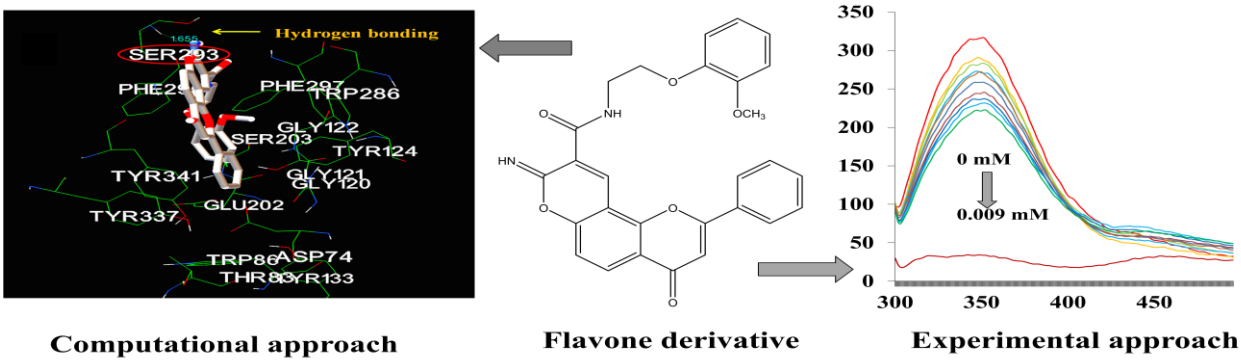
Abstract

Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by cognitive impairment, loss of memory and language deterioration[1]. In line with the modern paradigm of AD, a series of compounds composed of flavone and cyanoacetamide moieties have been reported as multifunctional agents against AD. Among them, the most active N-(2-(2-methoxyphenoxy) ethyl) moiety (CF-1) was studied inclusively to explore its interaction with AChE through fluorescence, circular dichroism and molecular docking methods.



Computational approach **Flavone derivative** **Experimental approach**

The fluorescence study showed maximum quenching upon binding of CF-1 with AChE through a static quenching mechanism. Moreover, circular dichrosim studies revealed that there is a marginal change in the secondary structural content of AChE due to partial destabilization of protein-drug complexes. Molecular docking suggested that CF-1 bind strongly to the PAS of AChE. Overall, the multifunctional profiles and strong AChE binding affinity highlight CF-1as promising candidate for further pursuit of innovative multifunctional drugs for AD.

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A. G. *Mol. Pharmaceutics*, **2018**, *15*, 2206–2223

Elucidating the active interaction mechanism of binding of a coumarin cyanoacetamide with Acetylcholinesterase

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Abstract

Alzheimer's disease (AD) is a multifaceted neurodegenerative disorder characterized by loss of memory, progressive deficits in cognitive functions, and severe behavioral abnormalities[1]. A series of fused tricyclic 7-hydroxy-4-methyl coumarin derivatives were reported as novel multifunctional anti-AD agents[2]. The drug-binding mechanism of the most active N-(3-bromobenzyl) analog (HMC–1) with AChE at physiological pH 7.2 was elucidated using fluorescence, circulardichroism (CD), and molecular docking studies. The results showed the quenching of intrinsic fluorescence of AChE by HMC–1 with a binding constant of $K_{HMC-1} = 3.57\times10^4\ M^{-1}$, which corresponds to the free energy of (ΔG) -6.183±0.029 kcal M^{-1} at 25 °C. CD studies revealed that up on binding of HMC-1 to AChE, the protein secondary structure was partially unfolded. Molecular docking studies demonstrated that HMC–1 is bound to the PAS, mainly by the hydrophobic interactions but also by hydrogen bond interactions between the amido carbonyl group of HMC–1 and amino group of Phe295 with bond length of 2.023Å, which prove that the AChE-complex is stable in nature. All the results cumulatively demonstrate strong binding of HMC-1 with AChE, which further support its potential inhibition against AChE.

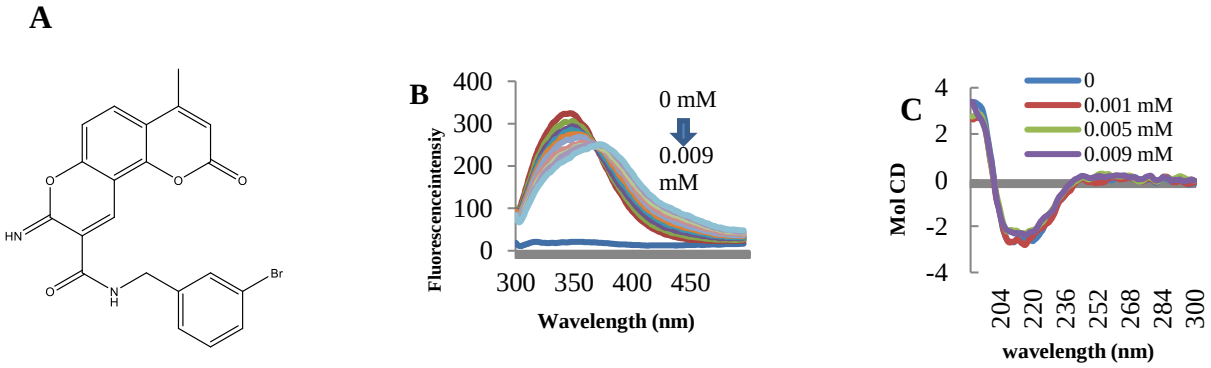

Figure 1. A. Structure of HMC–1. B. Room-temperature Fluorescence emission spectra of AChE-HMC–1 complex. C. CD spectra of the free AChE and AChE- HMC–1 complex.

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Technologies for processing, treatment and disposal of solid waste

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Abstract

It is a responsibility of every person to keep our environment clear and healthy by reducing solid waste. what is waste? Any material which is not needed by the owner, producer or processor is waste. There may be different types of waste such as Domestic waste, Factory waste, Waste from oil factory, E-waste, Construction waste, Agricultural waste, Food processing waste, Bio-medical waste, Nuclear, Slaughter house waste etc. Population explosion, coupled with improved life style of people, results in increased generation of solid wastes in urban as well as rural areas of the country. Government, NGOs and Private companies has taken various initiatives for processing, treating and disposal of solid waste in the past few Decades. An effective Solid Waste Management system should aim at minimizing manual handling and 100 % collection & transportation of solid wastes should be achieved. Composting, Vermi composting, waste to energy, Incineration, sanitary landfills and land fills gas recovery, exchange, anaerobic digestion and Biomethanation, dumping are some of the technologies followed for waste management. Almost all the components of solid waste have some potential if it is converted or treated in a scientific manner. Hence we can define solid waste as “Organic or inorganic waste materials produced out of household or commercial activities, that have lost their value in the eyes of the first owner but which may be of great value to somebody else.”(Robinson, W.D.1986). Environmental friendly way to manage waste, a more comprehensive approach to sustainable development summarized by doing the three R’S (Reduce, Reuse and Recycle). The objectives of writing this paper is to study the current practices related to the various Technologies for processing, treatment and disposal of solid waste management initiatives taken in India for human well being. Adoption of newer technologies related to recycling and other waste management options but we can play a very important role in this process if we can adopt only few tips. Here are a few tips to achieve this goal.

Keywords

Solid waste, Technologies, reduce, reuse, recycle, Environment

Environmental Education Is Need of The Hour

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Abstract

Environment is an essential element for sustainable development. It seeks to achieve the level of competence and citizenship in all students that will enable them to contribute to the achievement of sustainable societies. The chief objective of environmental education is that learners should acquire awareness and knowledge, develop appropriate attitudes, skills and abilities and participate in solving environmental problems. The worlds attention nowadays is focused on the state of environmental degradation and the need to satisfy the demands of the growing population. The idea that the responsibility of the environment must rest with every citizen is accepted all over the world and programs promoting environment education and awareness has become an integral part of educational endeavors. Serious environmental problems such as climate change, pollution, loss of biodiversity due to land degradation and waste management are experienced world wide and environmental education is seen to be a key response to these problems. The present study is evaluative in nature as it is devoted to appraise the information about prevailing conditions or situations for the purpose of improvement, the study assess how environmental education can be made more effective programme for further sustainable development. And to facilitate this survey method is used. For the present study simple random sampling technique is used. Observation schedules and suitable rating scales were developed to collect the data. The ultimate aim of the present study is to acquaint children with broad range of human activities that are harmful and meaningful to them and to provide a variety of local experiences so that child's learning will be constructive and helpful in the conservation of environment.

Green Chemistry Methods Used In Nano Praticals

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Abstract

Green chemistry emerged from a variety of existing ideas and research efforts in the period leading up to the 1990s, in the context of increasing attention to problems of chemical pollution and resource depletion. The development of green chemistry in Europe and the

United States was linked to a shift in environmental problem-solving strategies: a movement from command-and-control regulation and mandated reduction of industrial emissions at the "end of the pipe," toward the active prevention of pollution through the innovative design of production technologies themselves.

Green Chemistry Methods Used in Iran to Produce Zinc Oxide Nano particles

This method is based on the standards of green chemistry due to the use of biological and green reactants instead of toxic chemicals and contaminants. In addition, carrying out the synthesis at ambient temperature and pressure significantly decreases costs, increases speed and reduces the environmental pollution in comparison with the normal chemical methods. In this research, biocompatible nanoparticles based on zinc oxide were synthesized through green chemistry standards. Carrying out all reactions in the green solvent of water, use of biological reactant and elimination of toxic and polluting materials and solvents are among the most important advantages of the proposed method.

The industrial and usual application of zinc oxide nanoparticles is in rubber industry due to its isolation against electricity, high heat capacity, good adhesion properties and perfect coating strength. The use of zinc oxide nanoparticles in rubber leads to the smooth appearance of the rubber, increases its durability, maintains its strength at high temperature and increases the life of the rubber.

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Key Words :
Nano piraticles, Green chemistry,Green solvent

One-pot Sequential Propargylation/Cycloisomerization: A Facile [4+2] Benzannulation Approach to Aza[5]helicenes

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Abstract

Helicenes belongs to an interesting class of polycyclic aromatic or heteroaromatic compounds with ortho-annulated rings. Helicenes with heteroaromatic units have been extensively studied due to their interesting optical and electronic properties.[1] Along with usual carbohelicenes, heterahelicenes like aza- and thiahelicenes have also emerged as a very attractive class of molecules. These have possible applications in the fields such as light-emitting devices and chemosensors[2] and also in enantioselective transformations, as chiral inducers, in the fields of asymmetric catalysis, self-assembly and metal coordination complexes. In the view of its wide applications in the field of

science, development of methods for the synthesis of heterahelicenes is highly desirable. We have developed a novel [4+2]-benzannulation followed by double cyclisation using suitably substituted alkenyl thiophenes/alkenyl pyrroles (**2**) & (**3**) as the C_4 synthons and diynyl propargylic alcohols (**1**) as C_2 synthons. This approach offers a significant advantage by giving an access to hetero annulated carbazoles and aza-helicenes (**4**) & (**5**) from easily accessible substrates.

Key words

Annulation, Helicenes, Azahelicenes

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Nanochmistry in the Field of Medicine

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Abstract

Nano chemistry is the combination of chemistry and Nano science. The prefix ‘nano’ is a Greek word which means “dwarf”. The word “nano” means very small or miniature size. Nano technology is the treatment of individual atoms, or molecules or compounds into structures to produce materials and devices with special properties.Nano Chemistry is associated with synthesis of building blocks which are dependent on size, surface, shape and defect properties. These solid structures are built atom by atom in a controlled manner, allowing for impurity doing at for control of the wire’s electrical conduction properties. Nano chemistry also has a use in lab-on-a-chip technologies which are designed to carry out complex chemical processes on an ultra-small scale.

Nano Chemistry unitesNano Science and Chemistry. Nano Chemistry works from the atom up, with the aim of engineering Nano-sized materials. They use a number of methods to prepare and assemble ‘little pieces of matter’ which display unique magnetic, electronic, optical, chemical and mechanical behaviours attribute only to their Nano-meter size.

Nano Chemistry also focuses on how these individual atoms can assemble into larger molecules and the behaviour they exhibit.

Nano bio-technology techniques can be applied in medicine. It offers the key to faster and remote diagnostic techniques-including new high thought-out diagnostics, multi parameter, tuneable diagnostic techniques and biochips for a variety of assays. Tissue-engineered medical products and artificial organs, such as heart valves, veins and arteries,

liver and skin development. These can be grown from the individual's own tissues as stem cells on 3-D scaffold or by the expression of other cell types on a suitable substrate. Proteomics, Genomics, Nano-Engineering and Nano-Robot therapeutics are other users of this. Applications of Nanoparticles in drug delivery, protein and peptide delivery, cancer are explained. Applications of various Nano systems in Cancer therapy such as Carbon Nanotube, Dendrimers, Nano crystal, nanowire,Nano shells etc., are given. The advancement in Nanotechnology helps in the treatment of Nuero degeneration disorders such as Parkinson's disease and Alzheimer's disease.

Keywords

Nano medicine, carbon nanotube, nanometre, diagnostic techniques and bio chips.

Environmental Pollution through Waste Management

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Abstract

This paper will discuss the problem of environmental pollution Through waste management. Everything that surrounds us is directly or indirectly connected to the environment. Not only the man, but also other living beings as well as the nature like volcanic eruptions, earthquakes have effects on environmental pollution. Environmental pollution is present from the very beginning of life, but today it is a serious problem that threatens the survival of mankind. Today We Can say that we live in a world of waste because of Population growth and production increasing amount of waste that makes landfill are becoming more numerous and increasingly degrade the Environment. Now-a-days because of inadequate treatment of waste could be a higher number of infectious diseases.

Acquisition and improvement of education

Prevention of waste ,reuse of waste and recycling ,separation of recyclable materials from the waste and the use of waste as an energy resource development processes and methods of waste disposal, remediation of unregulated dumps, and developing awareness of waste management involves waste management. Acquisition and improvement of education and training of persons who manage waste is one of the method that to reduce the Environmental pollution . Reducing Environmental pollution is an important goal of sustainable waste management. Recycling is one of the useful method aimed at maximum utilization of energy and raw materials from waste. It is necessary to improve waste management Strategies starting from minimizing waste at source, via rebooting the use of secondary raw materials, recycling and disposal too.

Keywords

Environmental pollution, Waste, Waste management, Population, Prevention, recycle

Institutional Waste Management And Recycling

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Abstract

Indian society was regarded as traditional society until twentieth century and modernization emerged thereafter due to changing the social values that attributed to create new social structure and social institutions. Through modernization and advancement in science and technology improves the living standards of society. It results in greater exploitation of natural resources and pollution of environment. And also improves production waste from the institutions like schools, colleges, hospitals, prisons etc. As consequences of increase in institutions and other governmental sectors, enormous amount of waste being generated with negative impact on the environment. Composition of waste was found to be predominantly organic and inorganic, suggesting strong resource recovery potentials in terms of production of biogas and recycling.

Keywords

Environment, Waste management, Recycling

Triclosan Resistant bacteria and Antibiotics Cross Resistance

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Abstract

Triclosan [5-chloro-2-(2,4-dichlorophenoxy)phenol; TCS] is a synthetic, non ionic antimicrobial agent frequently used as disinfectant in soaps, toothpastes, cosmetics, and healthcare products. Triclosan exhibits broad-spectrum antimicrobial activity against wide range of bacteria and it targets enoyl-acyl carrier protein (ACP) reductase coded by *fabI* gene or its homolog *InhA* in mycobacteria, specific protein involved in the fatty acid biosynthetic

pathway. However, many recent studies have reported the emergence of triclosan resistance in several clinically relevant bacteria including *Escherichia coli, Pseudomonas aeruginosa, Salmonella enteric and Staphylococcus aureus.* Mechanism of triclosan resistance includes mutations in *fabI* gene or expression of multidrug efflux pumps. Further, limited number of studies have shown that the cross resistance or co-resistance to clinically important antibiotics in triclosan resistant pathogenic bacteria such as *E. coli, S. enterica* and *P. aeruginosa.* Studies are warranted to delineate the mechanisms of cross resistance and its impact on the ecology of the microflora of humans and the environment. Thus, widespread use of triclosan may represent a potential public health risk due to the emergence of dangerous pathogenic bacteria that are resistant to both biocides and clinically important antibiotics.

Key words

Triclosan, Biocide, Antibiotics, Cross resistance.

Quorum Sensing Inhibition or Quorum Quenching:Promising alternative to Antibiotics use

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Abstract

In recent decades, antibiotics are widely and extensively used in healthcare, agriculture, veterinary and aquaculture to counter bacterial infections. Due to indiscriminate use of antibiotics, many bacterial pathogens acquired resistance against the available antibiotic arsenal. Antibiotic resistance emerged as major global public health problem. Therefore, quest for the development of alternative methods to control multiple antibiotic resistant bacterial pathogens is of paramount importance. Additionally, sparse availability of novel antimicrobial agents further necessitates the exploration of alternative therapies.One novelpromising anti-virulence strategy or therapeutic concept is interruption of bacterial cell to cell communication, quorum sensing (QS). The quorum sensing system controls number of virulence factors required by bacteria for their pathogenesis. Thus, targeting quorum sensing

offers less or low selective pressure for the evolution of resistance as it aims at bacterial virulence factors rather than killing the bacteria.In the recent past, several studies have reported that disruption of quorum sensing in pathogenic bacteria such as*Pseudomonas aeruginosa, Staphylococcus aureus, Vibriofischeri, V. harveyi, Escherichia coli* and *V. cholerae* etcusing natural and synthetic QS inhibitors (QSIs). This review focuses on the existing mechanisms that enable to interfere with QS with potential application forthe bacterial control.

About the Editor

Dr. Vijaya Yarramuthi obtained M.Sc. (2003), M.Phil. (2006) and Ph.D. (2009) in Chemistry from Sri Venkateswara University, Tirupati, Andhra Pradesh, India. Visiting Researcher at Research centre for Soil & Water Resources and Natural Disaster Prevention, National Yunlin University of Science & Technology, Taiwan (2019). Dr. Vijaya presently working as Associate Professor & Head in the Department of Chemistry, Vikrama Simhapuri University, Nellore, Andhra Pradesh, India. Her research interests are Adsorption Process in Water Treatment (Removal of metals, phenols, dyes and fluorides) and Design and synthesis of natural and synthetic adsorbents for water treatment. Dr. Vijaya published over 30 research papers with good impact factor and total citation index of **1767, h- index of 14, i-10 index of 16** in various top tired journals including Carbohydrate Polymer Journal, Bioresource Technology and Chemical Engineering Journal etc.

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