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(NAAC ACCREDITED, CGPA 2.70, GRADE-B)

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- (iii) Physics, Statistics, Mathematics
- (iv) Biotechnology
- (v) Microbiology

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**1. FACULTY OF ARTS & SOCIAL SCIENCE : M.A.**

Drawing & Painting, Economics, Education, English, Geography, Hindi, History, Mathematics, Persian, Political Science, Sociology, Urdu.

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**4. FACULTY OF COMMERCE : M.Com.**

**5. FACULTY OF EDUCATION : M.Ed.**

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**Prof. Jamil Ahmad**

Principal

G.F. College, Shahjahanpur

Mob.: 9415510620

**Janab Syed Moinuddin**

President

G.F. College Management Committee

Shahjahanpur

**National Conference**

On

**“Recent Developments in Nanoscience  
and Green Chemistry”**

(RDNGC-2020)

**February 1 & 2, 2020**

**(Saturday & Sunday)**

**Souvenir  
&  
Abstracts**

Organized by

**Department of Chemistry**

**Gandhi Faiz-e-Aam College, Shahjahanpur**

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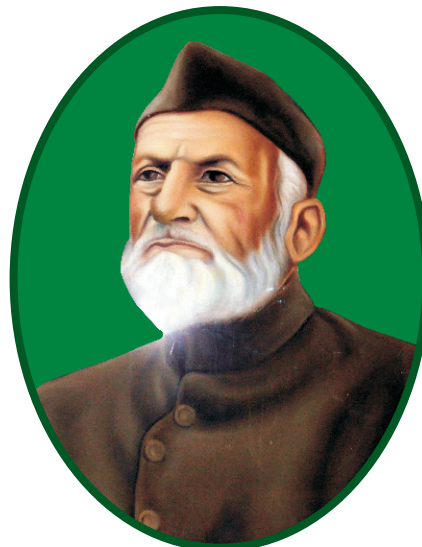
**Higher Education Department**

**Government of Uttar Pradesh**



**K.B. Mohd. Fazl-ur-Rahman Khan**

(1893-1971)



**Founder**

**Gandhi Faiz-e-Aam College  
Shahjahanpur (U.P.)**

**Alhaj Mohd. Jamil Uddin Khan**

(1938-2011)



**Former President, Managing Committee  
Gandhi Faiz-e-Aam College  
Shahjahanpur (U.P.)**

# SCIENTIFIC SYNDICATE

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**SOUVENIR / ABSTRACT**  
**NATIONAL CONFERENCE**

ON

**“Recent Developments in Nanoscience and Green Chemistry”**

**(RDNGC-2020)**

**February 1 & 2, 2020**

**(Saturday & Sunday)**



Sponsored by

**Higher Education Department**  
**Government of Uttar Pradesh**

Organized by

**Department of Chemistry**  
**Gandhi Faiz-e-Aam College, Shahjahanpur**

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(UGC Identified College with Potential for Excellence)

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## About the college

Gandhi Faiz-e-Aam College, Shahjahanpur is the only college of the Mahatma Jyotiba Phule (M.J.P.) Rohilkhand University, Bareilly, identified as a “College with Potential for Excellence” by UGC. It started its journey towards excellence in 1947 at the dawn of independence. The college was founded by great visionary Khan Bahadur Mohd. Fazl-Ur-Rahman Khan. It is a multidisciplinary co-educational institution which is managed by a charitable society, “Muslim Educational Society”. At present college runs undergraduate, postgraduate, diploma and certificate courses through faculties like Science, Commerce, Arts, Education, Management, Library Science, Computer Science and Information Technology.

The college is recognized by its capacious campus and alluring green lawns. The college has extremely good infrastructure including spacious smart lecture theaters, a highly well stocked and fully automated central library, well equipped laboratories, vast multipurpose hall, well furnished committee hall, gymnasium with latest exercise machines, hall for indoor games and large playgrounds for outdoor games. Besides, there is a beautifully designed building recognized as Advanced Research Centre with facilities like auditorium and library for cultural and heritage research.

The Department of Chemistry has been providing quality education since inception of the college. Department has unique identity in the college for the last 72 years as it had made all round development through innovative educational programmes and researches. Quantitatively it has 1280 intake at graduate level and 30 students at postgraduate level. Together with highly competent teaching faculties, department has dextrous non teaching staff. Moreover, there is a seminar library and maintained laboratories for all degree students. Department has been successfully running the “Chemical Association” formed by the students under supervision of teachers for the last 15 years to improve the academic environment. Department also provides research facilities in all branches of chemistry for Ph. D. aspirants.. A good number of NET/GATE qualified students and Ph. D. awardees in chemistry is an evidence of merit of the department.

**Anandiben Patel**  
Governor, Uttar Pradesh



Raj Bhavan  
Lucknow - 226 027



**11 December, 2019**

## **Message**

It is a matter of great pleasure that Gandhi Faiz-e-Aam P.G. College, Shahjahanpur is organizing a National Conference on the theme 'Recent Developments in Nanoscience and Green Chemistry' on 1<sup>st</sup> and 2<sup>nd</sup> February, 2020. To mark the occasion a 'Conference Book' is also being published.

I am sure that the Conference will bring together research workers and academicians to a common platform so as to exchange ideas and stimulate discussion on the topic and developmental activities in the concerned field.

I extend my best wishes for the success of the Conference and publication of the '**Conference Book**' on the occasion.

*Anandiben Patel*

**(Anandiben Patel)**



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گاندھی فیضِ عام کالج، شاہجہاں پور

مہاتما جوتی باپھولے روہیلکھنڈ یونیورسٹی سے الحاق شدہ مسلم اقلیتی ادارہ



**Syed Moinuddin**

President

Managing Committee

## Message

It gives me immense pleasure to know that the Department of Chemistry, Gandhi Faiz-e-Aam College, Shahjahanpur is organizing a National Conference on “Recent Developments in Nanoscience and Green Chemistry” on February 1-2, 2020.

I am sure that this conference will provide an ideal platform for interaction and sharing of information of research and development among distinguished academicians, eminent scientist and research scholars.

I warmly welcome all the participants in the 'City of Martyrs' and wish that you will enjoy fruitful lectures of eminent speakers in the national conference. I believe that the outcome of this event can serve mankind in a better way by using strategies of environment protection and also help in making our environment green and clean.

I congratulate the organizers and convey my best wishes for all success of the conference.

*Moinuddin*

(SYED MOINUDDIN)

President

Managing Committee,  
G.F. College, Shahjahanpur

# छत्रपति शाहू जी महाराज विश्वविद्यालय, कानपुर-208024 Chhatrapati Shahu Ji Maharaj University, Kanpur-208024

प्रो. नीलिमा गुप्ता

कुलपति

**Prof. Neelima Gupta**

Vice-Chancellor



कार्यालय/Offi. : +91-512-2581280

फैक्स/Fax : +91-512-2585280

ई-मेल/e-mail : veocsjmu@gmail.com

वेब/Web: : www.kanpuruniversity.org

December 11, 2019

## *Message*

It gives me pleasure to learn that Department of Chemistry, **Gandhi Faiz-e-Aam College**, Shahjahanpur is organizing a **National Conference** on "**Recent Development in Nanoscience and Green Chemistry**" (RDNGC-2020) sponsored by the Higher Education Department, Government of Uttar Pradesh on February 1<sup>st</sup> & 2<sup>nd</sup>, 2020.

**Gandhi Faiz-e-Aam College, Shahjahanpur** is a renowned institute. affiliated to **Mahatma Jyotiba Phule Rohilkhand University, Bareilly**. I am glad to learn that the Department of Chemistry has been providing quality education since inception of the college for the last 72 years and has made all round development through innovative education programmes and researches.

Nanoscience coupled with green chemistry draw the attention of academicians as well as researchers as these have promise to sustainable development which not only fulfils the requirements of the present generation but also makes available the resources for future generation. **The National Conference on "Recent Developments in Nanoscience and Green Chemistry"** is an appropriate topic for the present scenario and a wonderful attempt to provide a platform by the **Department of Chemistry, Gandhi Faiz-e-Aam College** for academicians, research scholars, religious leaders and all those who are interested in Nanoscience and Green Chemistry.

I convey my best wishes to the organizers, students, faculty members and the whole college for organizing this event and wish the Conference a grand success.

**Pro. (Neelima Gupta)**

Vice-Chancellor

To,

**Prof. Jamil Ahmad**

Principal

Gandhi Faiz-e-Aam College,

Shahjahanpur

प्रो. अनिल शुक्ल  
Prof. Anil Shukla

कुलपति  
Vice-Chancellor



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बरेली-243006  
MAHATMA JYOTIBA PHULE ROHILKHAND UNIVERSITY

## Message

It gives me great pleasure to know that Department of Chemistry, Gandhi Faiz-e-Aam College, Shahjahanpur is going to organize National Conference on **"Recent Developments in Nanoscience and Green Chemistry (RDNGC-2020)** sponsored by the Higher Education Department, Government of Uttar Pradesh on February 1 & 2, 2020.

I extend my warm greetings to all the delegates and my best wishes to the organizers of this conference for the success of this event.

I wish the conference all success with a hope that it will strengthen the Indian minds.

(Anil Shukla)



**Prof. Mushahid Husain**  
Professor of Physics/Nanotechnology

Former, Vice Chancellor , M.J.P. Rohilkhand University, Bareilly  
Founder Director: Centre for Nanoscience and Nanotechnology,  
Jamia Millia Islamia (Central University), New Delhi  
Mobile No.: 9811214084  
Email Id: mush\_phys@rediffmail.com

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### Message



It gives me immense pleasure to greet all the delegates who are taking part in the *National Conference on "Recent Developments in Nanoscience and Green Chemistry (RDNGC 2020)"* during February 1-2, 2020, being organised by Department of Chemistry, Gandhi Faiz-e-Aam College, Shahjahanpur. The enormous developments in field of nanoscience and nanotechnology which is implicitly and explicitly affecting the well being of the society is really fascinating. However, the ever improving technology has added another dimension to the wondrous world of nanotechnology in terms of Green Chemistry and in turn the green synthesis which is not only cost effective rather eco-friendly as well. With science and technology making rapid strides, it's important to give exposure to our younger lot of students and researchers to the latest trends in this game changing field. I hope this symposium will fulfil that need. The technical programme covers the important relevant topics.

I am sure all the participants would benefit from this conference. I wish great success to the organisers, delegates and the young researchers.



(Prof. Mushahid Husain)

**सुरेश कुमार खन्ना**

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**संदेश**

हर्ष का विषय है कि गांधी फ़ैज़-ए-आम (पी.जी.) कॉलेज, शाहजहाँपुर द्वारा "Developments in Nanoscience and Green Chemistry" (RDNGC-2020) का आयोजन किया जा रहा है।

आशा करता हूँ कि महाविद्यालय छात्र/छात्राओं में नैतिक व मानवीय मूल्यों के विकास के साथ-साथ भविष्य में गुणवत्तापूर्ण शिक्षा प्रदान कराने में निरन्तर अग्रसर रहेगा तथा पत्रिका में प्रकाशित लेख उनके लिए मार्गदर्शक और उपयोगी सिद्ध होंगे।

पत्रिका के उद्देश्यपरक प्रकाशन हेतु मेरी शुभकामनाएं।

(सुरेश कुमार खन्ना)

प्रो० जमील अहमद

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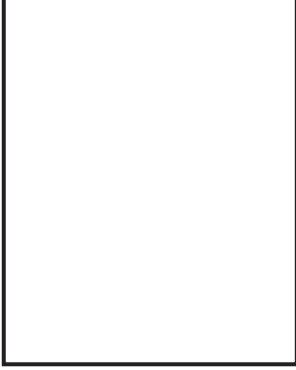
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आदरणीय महोदय,

मुझे यह जानकर अत्यंत प्रसन्नता हुई है कि जी.एफ. कालेज, शाहजहाँपुर दो दिवसीय राष्ट्रीय कॉन्फ्रेंस "Recent Developments in Nanoscience and Green Chemistry" RDNGC-2020 का आयोजन कर रहा है।

मुझे पूर्ण विश्वास है कि कॉन्फ्रेंस उच्च शिक्षा में शैक्षणिक एवं अनुसंधान कार्यों में व शिक्षाविदों, नीति निर्माताओं को एक सार्वजनिक मंच प्रदान करेगा जहाँ वे अपने अनुभव बाँट सकेंगे तथा समाज एवं देश को उच्च शिक्षा के विकास में नई दिशा देने में सफल होंगे। इस दिशा में महाविद्यालय तथा कॉन्फ्रेंस आयोजन मण्डल का उत्साहवर्धक प्रयास सराहनीय है।

कॉन्फ्रेंस के सफल आयोजन हेतु मेरी हार्दिक शुभकामनायें।

सादर

भवनिष्ठ

  
(डा० राजेश प्रकाश)

प्रतिष्ठान में,

डा० जमील अहमद  
प्राचार्य,  
जी.एफ. कॉलेज,  
शाहजहाँपुर



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گاندھی فیضِ عام کالج، شاہجہاں پور

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**Prof. Jamil Ahmad**  
Principal

## Message

It is heartening to note that a National Conference is being organized under the auspices of Department of Chemistry at Gandhi Faiz-e-Aam College, Shahjahanpur on “Recent Developments in Nanoscience and Green Chemistry” on February 1-2, 2020.

The conference, I hope, will provide an interactive platform to academician and scientific community to discuss the development in the latest innovation and apply for betterment of mankind. I would like to thank president managing committee for support and encouragement. I am also thankful to Department of Higher Education for providing this opportunity and financial support.

I would like to congratulate and convey my best wishes to the organizing committee and all other supporting staff for great success of this conference.

*Jamil Ahmad*

**(Prof. Jamil Ahmad)**

Principal

G.F. College, Shahjahanpur



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**Dr. Naeem Uddin Siddiqui**  
Organizing Secretary

## Message

On behalf of organizing committee of RDNGC 2020, I extend my warm regards to all illustrious delegates in exquisite sprawling campus of Gandhi Faiz-e-Aam College, Shahjahanpur. A national conference on Recent Developments in Nanoscience and Green Chemistry (RDNGC 2020) is being organized by Department of Chemistry on 1 & 2 February 2020. The theme of conference is very appropriate since the world is seeking for a sustainable development. The main aim of this two day conference is to provide a rostrum for academicians, researchers and students to interact with each other, share their novel ideas and motivate the worthy audience with their deep knowledge.

RDNGC 2020 is attracting best research articles and book chapters in the field of Nanoscience and nanotechnology, Green chemistry application, Sustainability & environment safety and Waste minimization & preservation. We are extremely hopeful that the outcome of RDNGC 2020 will benefit the society and will generate innovative solutions to chronic challenges of environment.

I feel honoured to express my sincere thanks to Janab Syed Moinuddin Sb., honourable president, Managing Committee of the college for his patronage and also thanks to Higher Education Department, Government of Uttar Pradesh for providing financial assistance. I also place my deep sense of obligation to Prof. Jameel Ahmad, Principal Gandhi Faiz-e-Aam College, Shahjahanpur for giving valuable suggestions and providing requisite facilities for this conference. I would like to thank the members of different committees, research scholars, technical and supporting staff of the college for overall support and coordination.

On the part of Department of Chemistry, I offer my best wishes to all the participants and also pray to Almighty for a splendid success of this conference.

*Naeem*

(Dr. Naeem Uddin Siddiqui)

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President - Managing Committee  
Gandhi Faiz-e-Aam College, Shahjahanpur

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Prof. Jamil Ahmad  
Principal, Gandhi Faiz-e-Aam College, Shahjahanpur

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Head, Department of Chemistry

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Dr. Abdul Moheman

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Biotechnology & Microbiology Department

G.F. College, Shahjahanpur

## KEYNOTE

### KEYNOTE : 01

## NANOTECHNOLOGY: THE CORNER STONE OF THE TECHNOLOGICAL REVOLUTION

### Prof. Mushahid Husain

Former Vice Chancellor, MJP Rohilkhand University, Bareilly

Founder Director: Centre for Nanoscience and Nanotechnology, Jamia Millia Islamia (Central University, New Delhi)

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Nanotechnology is the science and technology of small things. This small could be defined as something less than 100 nm of size. It is the domain where small becomes big in its true sense. In the simplest and crudest form, the nanotechnology could be understood as size effect. It deals with manipulating matter at atomic or molecular level.

As the size of a material approaches nanoscale, it witnesses dramatic changes in its properties be it mechanical, electrical, optical or even physical appearance. Gold can be taken as an example. The bulk gold has been known as the "yellow" metal because of its yellowish colour, but as the gold particles are reduced to nano scale their colour would be different depending upon the actual size. A gold nano particle having 90 nm size will appear blue-green while the one of 30 nm would be red in appearance. The reason is attributed to the interaction of electron cloud at the surface of metals with photons of light falling on it. At nanoscale this cloud begin to resonate with different wavelengths of light as a result the colour of gold particles keeps changing with change in particle size. Moreover, at scale lower than 10 nm the gold loses its metallic properties i.e., conduction. Other metals also show similar behaviour at nanoscale. Likewise, several other properties of materials do change at nanoscale. Therefore, not all the properties of any material can be stated in isolation with the particle size. Thus nanotechnology provides an opportunity to utilize peculiar properties of nanomaterials unconventionally and ingeniously.

Nanotechnology has faded the virtual boundaries of different streams of science and resulted into a confluence of them all. The impact of nanotechnology is quite evident 2

from the extent it has penetrated into the fields of medicine, environment, energy, information technology , consumer goods, defence, a few to mention. The very first mention, of concept or possibility of nanosized materials which subsequently led to the term "nanotechnology" could be derived from famous lecture of Richard Phillips Feynman, the professor of California institute of Technology at the session of the American Physical Society in 1959. This lecture called "There is a lot of space down there" indicated towards the possibility of creating nano-sized products with the use of atoms as building particles.

The term "nanotechnology" was introduced for the first time by N. Taniguchi at the international conference on industrial production in Tokyo in 1974. The idea of nanotechnology was further developed by E. Drexler in his books called " Engines of creation: the arrival of the nanotechnology era" published in 1986 and "Nanosystems" in 1992. In his books he showed how the nanoscale assembler robots would build structures at molecular level. Although, the nano era came up in late 20th century, people were aware of nanosized materials, subconsciously. The nano level processing was very much in practice even during ancient times e.g., use of natural fabrics like, flax, cotton, wool silk etc. which possess a developed network of pores of the size ranging from 1 to 20 nm. The nano-porous nature of these natural fabrics helps them absorb sweat well,



## KEYNOTE

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rapidly swell and dry. The process of making bread, wine, beer and several other eatables involves fermentation at nano-levels which again is an ancient practice. So mankind has always utilised nanotechnology without actually knowing the reason and phenomenon involved.

Nanotechnology is being considered to be most promising technology of the current century which is expected to have direct impact on the societal needs of society in general and mankind in particular over the entire globe. The impact is being increasingly felt in all the frontiers of technologies. This field has opened an era of integration of fundamental research and engineering from the atomic and molecular levels, increased technological innovation, and an 3

enabling base for improving human health and cognitive abilities in long term. It has a wide range of potential applications in various fields such as electronics, optical communications and biological systems. The factors which support these applications are particularly their physical & chemical properties, high surface to volume ratio and small size which provide best possibilities for manipulation and room for accommodating multiple functionalities.

Nanomaterials are important for the utilization of nanotechnology and are thought to be an important product. They include mainly quantum dots, nanoparticles, nanowires, nanorods, graphene and nanotubes in scale of 1-100 nm. With the advancement in the development of nanomaterials, many new nanostructures are being produced for the applications in nanotechnology. Therefore, nanomaterials have become the backbone of research in the field of science and technology due to remarkable properties. The continuous interest in the research on nanomaterials is due to the infinite possibilities that they offer when they are manipulated on atomic scale. The interest in the production the materials at nanoscale arose due to their excellent mechanical and chemical properties, which are very different in comparison with material at micrometer scale with the same composition

The latest entry in the field of nanotechnology is in the form of 'Green Synthesis' which addresses the concerns raised due to inherent harms associated with traditional methods of nanomaterials synthesis. 'Green synthesis' is required to avoid the production of unwanted or harmful by-products through the build-up of reliable, sustainable, and eco-friendly synthesis procedures. The use of ideal solvent systems and natural resources (such as organic systems) is essential to achieve this goal. Green synthesis of metallic nano-particles has been adopted to accommodate various biological materials (e.g., bacteria, fungi, algae, and plant extracts). Among the available green methods of synthesis for metal/metal oxide nanoparticles, utilization of plant extracts is a rather simple and easy process to produce nanoparticles at large scale relative to bacteria and/or fungi mediated synthesis. 4

The nanotechnology has undoubtedly emerged as a technological revolution beyond any human experience. A new, more powerful industrial revolution capable of bringing wealth, health and education, without pollution, to every person on the planet.

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**KEYNOTE****KEYNOTE : 02****GREEN CHEMISTRY FOR SUSTAINING THE FUTURE****Prof. I.R. Siddiqui**

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In these environmentally conscious days green chemistry, sustainability and industrial ecology are new principles that are guiding the development of next generation of materials, products and processes. The development of chemistry during twentieth century has changed human life due to supply of product aimed to improve the quality of life. There is practically no facet in modern life in which chemistry does not play an important role either to supply consumer products or to improve services addressed to the society in general. Herein many chemicals and procedures are very hazardous, toxic and may have adverse effects on the environment and on human health. Thus, today the major challenge in synthesis lies in the development of simple, efficient, atom economical and eco-compatible transformations. Concerns about environment and human health issues necessitated a paradigm shift in organic synthesis from traditional synthetic procedures to greener and sustainable synthetic protocols.

## KEYNOTE

## KEYNOTE : 03

## PROCESSING OF POLYMER MATERIALS IN SUPERCRITICAL FLUIDS

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**Abstract**

Supercritical fluids (SCFs) are the state of matter operated above critical point wherein the boundaries of separation between gas and liquid phases are over. This state has unique diffusivity like gases with combined solvating power like liquids. Applications of SCFs as an alternative media in food processing, chromatography, energy production and drug development was recognized till beginning of 19th century, has now well accepted in processing of materials<sup>1-2</sup>. The most preferred SCFs are the supercritical carbon dioxide (SCC) and supercritical water (SCW). SCFs offers a series of unique methods of particle sizing, development of polymer composites, blends<sup>1-4</sup>, dispersion of layered silicates<sup>3</sup>, inorganic<sup>4</sup>, graphitic<sup>5</sup> and magnetic fillers<sup>6</sup> into solvents, monomers and their infusion into polymer matrix at ambient temperatures. This leads to the formation of nanocomposites for civilian, naval and aerospace applications<sup>1-6</sup>. Polymer functionalized nanostructured polyelectrolytes for photovoltaic and energy storage applications are successfully synthesized under supercritically controlled conditions<sup>7-9</sup>. Chemical oxidative polymerization and copolymerization are viably conducted in SCC<sup>10</sup>. Highly sensitive functional nanomaterials for antibacterial applications<sup>11</sup> sensor<sup>12</sup> and target delivery of drugs are conveniently synthesized in SCC<sup>13-15</sup>. The present talk, shall deliver the salient features of SCFs, their physical properties and applications in particle fabrication, polymerization, preparation of nanocomposites, nanohybrids, nanomaterials for wood preservation, nanocomposites for development of durable composite structures, electroactive nanomaterials for sensing, energy storage, target delivery systems and nanoparticle mediated microbial degradation of commodity plastic materials. Concluding remarks will be presented on simplicity, diversity, and commercial viability of SCFs processing of polymer nanomaterials.

**Key Words: Nanomaterials, Processing, Supercritical fluids,**

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**KEYNOTE****KEYNOTE : 04****NANOSTRUCTURES: SYNTHESIS, PROPERTIES AND APPLICATIONS****Sushil Kumar**

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Nano-science and technology is now well recognized as most promising way for demonstrating that the properties of materials are dimensional dependent; and hence nanostructures are employable for a large variety of applications. The template strategy combined with electrochemical deposition technique has been used to produce highly ordered and vertically oriented metal and/or semiconductor nanowires. The modifications in structural, optical and electrical properties of synthesized nanowire arrays through ion beam irradiation with different fluencies have been investigated using X-ray diffraction, UV-visible spectroscopy and current-voltage (I-V) characteristics techniques. The field emission scanning electron microscopy (FESEM) micrographs confirmed the formation of dense crops of metal and/or semiconductor nanowires of desired geometry and size. FESEM also revealed that synthesized nanowires were continuous, aligned and cylindrical with uniform diameter having high aspect ratio. X-ray diffraction (XRD) spectra of copper, selenium and tellurium nanowire arrays exhibited cubic, trigonal and hexagonal phases respectively. The crystallite size and micro-strain effect were estimated by Williamson-Hall analysis. The optical absorption spectra of copper nanowires exhibited a peak attributed to the surface plasmon resonance. The blue shift observed in the optical band gap of prepared semiconductor nanowires has been attributed to the quantum size effect. I-V characteristics revealed a significant change in electrical conductivity of irradiated metal and semiconductor nanowires. The defects produced by ion beam irradiation play a significant role in modifying the properties of metal and/or semiconductor nanowire arrays. The synthesized nanowire arrays have diverse applications in sophisticated device fabrication.

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## NANOTECHNOLOGY IN PHARMACEUTICS

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The study of structures and materials on the scale of nanometers (billionth part of a meter) comes under the purview of nanoscience, which is a fast emerging and most fascinating discipline of scientific and academic sphere. A closely associated term with nanoscience is the nanotechnology, which is the combination of and hence integrates several technologies being used in research and industry for designing and making functional objects and materials at the nanoscale, where at least one dimension of structure or material lies between 1 to 100 nm. The research field of nanotechnology being multidisciplinary attracts and engages not only persons from physics, chemistry and engineering streams but also bioscientists and environmentalists and is affecting or has potential to greatly influence every aspect of human life. Although nanoscience and nanotechnology has existed in nature from the very beginning of life on earth, as is manifested by several natural structures (adhesive and self cleaning property of Gecko foot, self healing underwater property of diatoms etc), but its evolution and recent progress is credited to renowned scientist Richard P. Feynman, who in 1959 delivered a famous talk, "There is plenty of room at the bottom" through which he predicted atom by atom manipulation of matter in future. With the invention of advanced instruments such as STM and AFM, his dreams and predictions have been realized by scientists to some extent. Much of the nanoscience and nanotechnology focusses on nanometer sized crystalline solids. Two basic approaches in nanotechnology are top-down and bottom-up for the synthesis of nanomaterials, which are materials at the nanoscale and possess drastically changed electrical, mechanical, thermal, optical, magnetic and electronic properties as compared to their bulk counterparts. An important characteristic of nanoparticles is their large surface area to volume ratio, due to which these materials become ideal candidates to be used in catalysis. They are already commercially used in paints, cosmetics, electronics etc. Nanoparticulates due to their small size have greater activity and increase bioavailability, solubility and efficacy of the drug. Polymeric nanoparticles in the form of nanocapsules and nanospheres have been researched greatly as drug delivery agents. Micelles, dendrimers, liposomes and solid-lipid nanoparticles are some of the other Nanoparticulates which have been found to be very useful in targeted drug delivery systems, which reduces loading of the drug. Liposomes in particular being vesicular in structure, can entrap drugs in their interior and release in a controlled manner at the specific sites and are therefore being tested for use in cancer therapy. However, toxicity issues of Nanoparticulates have to be addressed sincerely. In this talk I would like to introduce basics of nanoscience and nanotechnology and will throw some light on nanomaterials suitable for the field of pharmaceuticals.

**KEYNOTE****KEYNOTE : 06****Synthesis and characterization of graphene based nanocomposite for sensing applications**

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Abhishek Verma<sup>1</sup> and V. K. Jain<sup>1</sup>**

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Since the discovery of Graphene in 2004, this material is considered to be the key technology in the current century and is unique nanostructures with outstanding electronic, chemical and mechanical properties. Due to the extraordinary properties, graphene and its composite have great potential applications in sensors, nano-electronics/semiconductors, conducting composites, batteries, artificial muscles and polymer composites, which are important, both for scientific and technological development. In the present work, the synthesis of graphene using CVD and chemical methods has been shown. The surface morphology, bonding and nature of graphene and its nanocomposites have been investigated by various characterization techniques like scanning electron microscopy (SEM), Raman spectroscopy and transmission electron microscopy (TEM). An increase with the D/G (D, Disorder band; G, Graphite) ratio of Graphene and its composite in the Raman spectra revealed that graphene based composite have been successfully synthesized. The gas sensing properties of the nanocomposite has also been studied. As expected, the result exhibits that the graphene nanocomposite is highly sensitive, selective and stable for the sensing applications.

## Theme Area: Nanoscience and Nanotechnology

NN 01

ABSTRACT

### ELECTRON HOLE RECOMBINATION REDUCTION IN THE PREPARED TITANIAPHOTOCATALYST BY THE IN SITU OXIDATION OF POLYPYRROLE

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#### Abstract

The  $\text{TiO}_2$  and  $\text{TiO}_2/\text{PPy}$  with strong PL intensity has high recombination of charge carriers whereas  $\text{TiO}_2/\text{PPy}/\text{GO}$  has weak intensity. The weak PL intensity of  $\text{TiO}_2/\text{PPy}/\text{GO}$  may arise due to the coating of polypyrrole on Titania lattice. The  $\text{TiO}_2/\text{PPy}/\text{GO}$  with highest intensity in the photoluminescence spectra confirms the generation of more number of hydroxyl radicals compared to other photocatalysts. The fluorescence intensity follows the trend (i.e.  $\text{TiO}_2$ ,  $\text{TiO}_2/\text{PPy}$ ,  $\text{TiO}_2/\text{PPy}/\text{GO}$ ) of photocatalytic performance of all the photocatalyst. The coating of PPy and GO has enhanced the photocatalytic activity of Titania. Hence,  $\text{TiO}_2/\text{PPy}$  and  $\text{TiO}_2/\text{PPy}/\text{GO}$  are the efficient photocatalyst for the degradation of dyes than pure  $\text{TiO}_2$ .

**Keywords:** Photoluminescence spectra, recombination, photocatalyst, polypyrrole.

**A REVIEW ON SYNTHESIS OF NANO SIZED MXENES FOR DRGRADATION OF  
DIFFERENT POLLUTANTS**

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**Abstract**

In the developing society, water pollutants and environmental pollution are becoming more and more serious. . In recent years, photo catalytic has shown great potential as a low-cost, environmental-friendly, and sustainable technology. Here, a simple method to synthesize highly efficient catalytic compounds named as self-assembled MXenenanocomposites and self-reduction compounds has been proposed. Palladium nanoparticles were grown in situ on MXenenanosheets to form MXene. MXene composites with different reaction times were prepared by adjusting the reduction reaction time.  $M_{n+1}AX_n$  (MAX) phases are nano-laminated compounds based on a transition metal (M), a group A element (A), and carbon or/and nitrogen (X), which exhibit a unique combination of ceramic and metallic properties. The conventional preparation method is limited by conditions such as cumbersome operation, high energy consumption, and high pollution. There is the urgent need to develop a new type of sustainable green material for degradable pollutants. We review the classification of current photo catalysts and the methods for improving photo catalytic performance; we also further discuss the potential industrial usage of photo catalytic technology. This review also aims to provide basic and comprehensive information on the industrialization of photo catalysis technology. Fast and efficient degradation of organic molecules is caused by different factors, which makes the Mxene monohybrid a highly efficient photo catalyst and a promising candidate for much future applications.

**Keywords:** MXenes, Nano and Green Materials, pollutants and photocatalist.



**NANOSCIENCE AND NANOTECHNOLOGY: IT'S USE IN DIFFERENT FIELDS****Sunil Kumar**

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**Abstract**

Nanoscience and nanotechnologies are widely seen as having huge potential to bring benefits to many areas of research and application, and are attracting rapidly increasing investments from Governments and from businesses in many parts of the world. At the same time, it is recognised that their application may raise new challenges in the safety, regulatory or ethical domains that will require societal debate. In the information technology area, researchers are investigating the application of nanotechnology to the development of, high efficiency memories, computer devices with completely new operating principles, high-luminosity devices using nano-materials such as carbon nanotubes, and high-speed optical network devices using photonic crystals. In medical area, specialists are working on drug injections to certain organs using liposomes or nanomachines. And in the environmental and energy industries, it is thought that nanotechnology can be utilized in such applications as environment remediation catalysts and hydrogen-loading materials. In this way, nanotechnology is creating new industries across a wide range of fields and attracting interest as a infrastructural technology for enriching society. Recent advances in nanoscience.

**ELECTROSPUN NANOFIBERS MATS AS PROMISING ULTRATHIN  
CHROMATOGRAPHY PLATES**

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**Abstract**

Nanotechnology has advanced the high end technology as well as human daily life. Nanofibers are one of the nanotechnology architecture which is gaining attention of worldwide research due to their good surface area, easy functionality development and ease of fabrication. Electrospinning is an inexpensive, non-mechanical and scalable technique for synthesis of polymeric nanofibers. Depending on nature of polymer used and these nanofibers can be used in various applications such as enzyme immobilization, drug delivery, water purification, energy devices[1,2] and now days in ultrathin layer chromatography [3,4]. In present work, we have synthesized PAN based nanofibers mat/sheets using electrospinning [5]. These nanofibers were characterized using SEM for nanofiber morphology and FTIR for functional group analysis. The nanofibers mat of different thickness 40-100 $\mu$ m were further utilized as UTLC plates as stationary phase for detection and migration behavior of a number of amino acids. As compared to commercial thin plates the electrospun nanofibers have shown shorter analysis time and also used small amount of solvent. Such robust performance of nanofibers opens the gateway for replacing commercial thin layer plates.

**PARAMETERS AFFECTING THE ALPHA-PARTICLE REGISTRATION AND COUNTING IN LR-115 SOLID STATE NUCLEAR TRACK DETECTORS (SSNTD)**

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**Abstract**

In view of the fact that the radon progeny contribute the highest to the natural radiation dose to general populations, large scale and long-term measurements of radon and its progeny in the houses have been receiving considerable attention. Solid State Nuclear Track Detector (SSNTD) based systems, being the best suited for large scale passive monitoring, have been widely used for the radon gas (using a cup closed with a semi-permeable membrane) and to a limited extent, for the measurement of radon progeny (using bare mode in conjunction with the cup). These have been employed for radon mapping and indoor radon epidemiological studies with good results. In this technique, alpha tracks recorded on SSNTD films are converted to radon/thoron concentrations using corresponding conversion factors obtained from calibration experiments carried out in controlled environments.

The detector response to alpha particles depends mainly on the registration efficiency of the alpha tracks on the detector films and the subsequent counting efficiency. While the former depends on the exposure design, the latter depends on the protocols followed for developing and counting of the tracks. The paper discusses on parameters like etchant temperature, stirring of the etchant and duration of etching and their influence on the etching rates on LR-115 films. Concept of break down thickness of the SSNTD film in spark counting technique is discussed with experimental results. Error estimates on measurement results as a function of background tracks of the films are also discussed in the paper.

**Keywords:** SSNTD, Radon, Thoron, Alpha tracks.

**ANGULAR MOMENTUM DEPENDENCE ON INCOMPLETE REACTION  
DYNAMICS IN  $^{16}\text{O} + ^{160}\text{Gd}$  AT ENERGY 5.6 MEV/ NUCLEON**

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**Abstract**

Spin distribution of evaporation residues (ERs) populated via complete fusion ‘CF’ and incomplete fusion ‘ICF’ like  $xn$ ,  $\alpha/2\alpha-xn$  and  $\alpha/2\alpha p-xn$  channels have been observed in the interaction of  $^{16}\text{O}$  with  $^{160}\text{Gd}$  target nucleus at energy  $\sim 5.6$  MeV/A. These measurements have been done by performing the particle- $\gamma$  coincidence experiment using Charged Particle Detector Array (CPDA) + Gamma Detector Array (GDA) at IUAC, New Delhi. The experimentally measured spin distribution is constant up to  $9\hbar$  for direct  $\alpha/\alpha p-xn$  and  $11\hbar$  for  $\alpha/2\alpha p-xn$  (both associated with ICF), thereafter yield successively decreases exponentially with high spin states, while spin at half yield (i.e. mean input angular momentum) for all CF channels comes out to be  $7\hbar$ . An attempt has been made to extract the side-feeding pattern from the spin distribution for all ‘CF’ and ‘ICF’ channels like  $xn$ ,  $\alpha/2\alpha-xn$  and  $\alpha/2\alpha p-xn$  channels. It has been observed that CF products are strongly fed over broad spin range, while low partial waves are strongly hindered in the fast  $\alpha$ -emission channel (associated with ICF) in the forward direction and no side-feeding takes place in the low observed spin. These features of side feeding in ICF reaction product results are consistent with existing data. It has also been observed that mean input angular momentum for direct  $\alpha$ -emitting channels have been found to be relatively higher than evaporation  $\alpha$ -emitting channels and increases with direct  $\alpha$ -multiplicity in forward direction and hence lead to peripheral interaction.

**Key Words:** Heavy Ion Nuclear Reaction, Spin Distribution, Side-feeding.

**NANOMEDICINE AND CANCER TREATMENT: A BRIEF REVIEW****Fauzia Khan**

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**Abstract**

In nanomedicine, use of nanosized particles with various mediators and delivery systems is done for the treatment purpose. Cancer is one of the major medical problem and one of the leading cause of deaths worldwide. Prevailing cancer therapies are accompanied by late diagnosis and adverse side effects. Target of nanomedicine in the cancer therapy is not only to achieve early detection of cancer and targeted treatment but also minimize the side effects. Cancer chemotherapy drugs, approved by FDA are continuously on trial either alone or in combination. Research is being done with diverse chemotherapy drugs and nanoparticle delivery systems so that therapies can be planned for better treatment options and least toxicity. This review article focuses on the patterns of nano medicine delivery, their role in cancer treatment pattern with an emphasis on current scenario in cancer treatment. Let us hope for the ease of treatment and better success rate for nano medicine-based cancer chemotherapy

**Keywords:** Nanoparticles, nanomedicine, liposome, polymer, chemotherapy.

**NANO MATERIAL DEVICES AND APPLICATIONS OF NANO MATERIALS****Praveen Kumar**

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**Abstract**

Quantum dots are zero dimensional semiconductor nano structure substance. In quantum dots motion of charge carriers are in quantum confined region in all the three dimensions. Thus all the three dimensions becomes in a range of 1 to 100nm. Due to confinement, particle energies in quantum dots becomes discrete just like atoms. Due to this quantum dots are sometimes referred to as an artificial atoms. Some materials used for fabricating quantum dots are Cdse, GaAs, CdTe etc. Initially Quantum dots were fabricated through e-beam lithography, CVD or some other similar materials deposition techniques. However from 2000 onwards quantum dots become stand along semiconducting spheres fabricated using plasma synthesis.

**NANOTECHNOLOGY AND DRUG DELIVERY SYSTEMS****Sundar Singh<sup>1</sup> and Shashi Bhooshan Tiwari<sup>2</sup>**<sup>1</sup>Department of Physics, Bareilly College Bareilly-243005, U. P.  
Department of Pharmacy, FET, M. J. P. Rohilkhand University Bareilly, U. P.**Abstract**

The branch of science dealing with the study of structures and materials on nanometer scale is called nanoscience and is a fast emerging and most fascinating discipline of scientific and academic sphere. The term nanotechnology combines and integrates several technologies used in research and industry for designing and making functional objects and materials at the nanoscale (at least one dimension of material between 1 to 100 nm). Nanotechnology being multidisciplinary field attracts and engages persons from physics, chemistry, engineering, bio-scientists and environmentalists and is affecting or has potential to greatly influence every aspect of human life. Recent progress in nanotechnology is credited to renowned scientist Richard P. Feynman, who in 1959 delivered a famous talk, "There is plenty of room at the bottom" through which he predicted atom by atom manipulation of matter in future.

Two basic approaches in nanotechnology are top-down and bottom-up for the synthesis of nanomaterials. An important characteristic of nanoparticles is their large S/V ratio which makes them ideal candidates to be used in catalysis. Nanomaterials have already appeared commercially in products such as paints, cosmetics, electronics, drugs etc. In this chapter I would like to introduce basics of nanoscience and nanotechnology and will discuss some of their applications.

**NANOTECHNOLOGY APPLICATION: SPECIAL REFERENCE WITH  
BIOMEDICAL FIELD**

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**Abstract**

Nanotechnology is the study of extremely small structure having size of 1 to 100 nm. Nano medicines are relatively new field of science and technology. The application of nanotechnology in medical and bio medical engineering are vast and spans such as implant and tissue engineering, diagnosis and therapy. The present scenario demands designing of nanotools which can respond to the needs of biological problems and prepare more efficient biomedical approaches. Metallic, ceramic, polymeric and composite nano material have been investigated extensively for various biomedical application such as novel tissue engineering, targeted drug delivery system, biosensors etc. Nano technology plays a vital role in recent technological advances in the area of disease diagnosis, drug design and drug delivery.

Nano medical approaches to drug delivery focuses on developing nano scale particles to improve bioavailability of a drug. Special attention has been given to bioassay application such as biosensors; biomedical devices and bio fuel cells using nano material. Nano technology on a chip is a new paradigm for total chemical analysis system. Nano pharmaceutical can be used to detect disease at much earlier stages.

Applications of nanoparticles in drug delivery, protein and peptide delivery, cancer have been investigated. Application of various nano system in cancer therapy such as carbon nano tube, nano crystals, nano wire, nano shells etc are given.

**Keywords:** Biosensors, Biomedical Devices and Bio fuel cells.



**PERSUADE OF METALLIC NANOPARTICLES ON THE MORPHO-  
PHYSIOLOGICAL CHANGES IN PLANTS**

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**Abstract**

Plants are an integral part of the ecosystem, and play a crucial role in the incorporation of metallic nanoparticles in our food chain. The interaction of metallic nanoparticles with plants had varying effects on the morpho-physiological changes, but it may be contingent upon the plant species, types, and concentrations of nanoparticles. The metallic nanoparticles had the ability to increase the rate, and percentage of seed germination, root and shoot biomass of crop plants. The relevance of these nanoparticles also showed various dose-dependent responses on different agriculturally cultivated crops. Thus, the aim of this chapter is to summarize the effects of metallic nanoparticles on the various morpho-physiological changes in plant systems.

**Keywords:** Crop plants, Nanoparticles, Plant biomass, Seed germination.

ACETALDEHYDE SENSING, SPECTRAL AND BIOCIDAL STUDIES OF  
POLYCARBAZOLE-MULTIWALLED CARBON NANOTUBES (PCZ/MWCNT)  
NANOCOMPOSITE

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**Abstract**

We herein report the functionalization of multi-walled carbon nanotubes (MWCNT) *via* oxidation method using a concoction of concentrated H<sub>2</sub>SO<sub>4</sub> and HNO<sub>3</sub>. The electrically conducting polycarbazole-multiwalled carbon nanotubes nanocomposite (PCz/MWCNT) has been prepared by *in-situ* oxidation polymerization of monomer of carbazole (Cz). Several spectral techniques like FTIR, SEM/EDS, TEM, XRD and TGA were used to characterize PCz/MWCNTs nanocomposite. The analytical data ascertains a strong interaction between PCz and MWCNTs. The nanocomposite exhibits high thermal stability as compared to the pristine PCz. The nanocomposite demonstrated better electrical conductivity and isothermal stability with respect to DC electrical conductivity retention under normal conditions below 100 °C. The PCz/MWCNT based sensor was designed for the detection of acetaldehyde. It was observed that the resistivity of the PCz/MWCNT enhances on exposure to acetaldehyde at 25 °C, and showed a direct relationship between the response and concentration of acetaldehyde. Moreover, PCz and PCz/MWCNT were also tested for their plausible biocidal activity.

**Keywords:** Polycarbazole (PCz), Nanocomposite, Multiwalled carbon nanotubes (MWCNT).

**NANOTECHNOLOGY: GREEN TECHNOLOGY FOR TREATMENT OF WASTE AND WASTEWATER****Mishu Singh**

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**Abstract**

The unease over an escalating requirement for potable water with the ensuing increase in wastewater concurrently has increased the attentiveness for developing systems that can recover and improve the water quality. It has become mandatory to treat waste and wastewater to remove the contaminants and make it useful for other purposes. Industries have offered incentives to expand and improve the performance of existing technologies. The chief cause for wastewater management is that less than one percent of the world's water is potable while the remaining is getting briny and brackish. This increases the need for a technology that does not cause any detrimental effect on a human being. Varieties of nanomembranes and nonporous zeolites are extensively being used in the treatment of industrial effluent. Due to their excellent distinctiveness which resulted from their nanoscale size, nanomaterials have become the topic of vigorous research and development worldwide for the last many years for the removal of hazardous pollutants from effluents and thus have been successfully applied wastewater treatment plants.

**Keywords:** Industrial Effluent, Nanotechnology, Nanomembranes, Wastewater Treatment, Photocatalysts, Membrane Filtration, Zeolites.

**EFFECTS OF SOLVENT (CHLOROFORM/DMF) CONCENTRATION CHANGES IN  
POLYMER SOLUTION'S PROPERTY AND NANOFIBRE MORPHOLOGY FOR  
DIFFERENT APPLICATIONS**

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**Abstract**

In present years, Nanotechnology is the most advancement in different fields such as engineering, medical etc. Bone tissue engineering is one of the most focused and attend field in biomedical engineering. For medical applications, most of time, we need different properties such as mechanical properties, biocompatibility etc. The basic elements of bone tissue engineering in biomedical an appropriate cell source, optimal culture conditions and a biodegradable scaffold. The thermoplastic polymer based matrix can be used as scaffold for these type of applications. Therefore, we used to synthesize and optimize the concentration of solvents for preparation polymer solvent to prepare matrix polymer fibre by needle based electrospun technique. Here, we plan to used different solvents as such as chloroform(C), Polyethylene glycols(P)and Dimethylformamide(D) etc. in different ratio (C:P:D = 9:0.5:1, 9.3:0.3:0.7, 9.5:0.1:0.5) to prepare polymer solvent. All ratio shows the different properties such as viscosity, conductivity and fibre size. By optimizing all the property, we prepared nanopolymer solution. And, by using electrospun technique of needle based electrospinning, we can fabricate nanopolymer fibre. By using characterization technique such as SEM, TEM we can get nano size polymer fibre approx.. (150 nm-800 nm). This polymer can be used in different fields such as bio tissue engineering, textile and other applications.

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ABSTRACT

**THERMOLUMINESCENCE OF NANOCRYSTALLINE EU DOPED  $K_2CA_2(SO_4)_3$** **Rohitash Singh**

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**Abstract**

TL properties of nanocrystalline Eudoped  $K_2CA_2(SO_4)_3$  prepared by ball milling technique have been studied and the nanophosphor's suitability as an effective gamma radiation and proton beam dosimeter material has been examined. It is found that the nanophosphor is suitable for dosimetry over a very wide range of doses from 1 Gy to 1 KGy for gamma radiation. And for ion beam the same nanophosphor shows a more or less linear response for the dose range from 0.1Gy to 100 Gy. A comparative study of this nanophosphor with its corresponding microcrystalline form (prepared by solid-state diffusion method) as well as the nanocrystalline form prepared by co-precipitation method has shown that the nanophosphor prepared by the ball milling technique.

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ABSTRACT

**NANOSIZED METAL OXIDES: INTRODUCTION AND METHODS OF SYNTHESIS****Avnish Kumar Arora\* and Devendra Kumar Gangwar**

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**Abstract**

This Chapter is focused on the introduction of metal oxides, their applications and various methods of synthesis like Co-precipitation methods, Sol-gel processing, Pulsed laser deposition (PLD) Chemical vapor deposition (CVD) Template / Surface derivatized methods Solvothermal methods Micro-emulsion technique.

**NANO MEDICINE: SOLVE YOUR HEALTH PROBLEMS AT  $10^{-9}$  LEVEL****Swapanil Yadav**

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**Abstract**

Application of Nanotechnology involves various fields such as health, medicine, electronics, energy and environment. Applications of nano particles in drug delivery, protein and peptide delivery, cancer (explained. Applications of various nano systems in cancer therapy such as carbon nano tube, dendrimers, nano crystal, nano wire, nano shells etc.) are discussed in this chapter. Nano technology is also helpful in tuberculosis treatment, in ophthalmology, in surgery, visualization, tissue engineering, antibiotic resistance, immune response.

**Keywords:** Carbon nano tubes, Dendrimers, Drug delivery, Nano particles.

**POLYINDOLE/TUNGSTEN CARBIDE NANOCOMPOSITE BASED  
ELECTROCHEMICAL SENSOR FOR CHOLESTEROL ESTIMATION**

**Shubham Sharma, KavitaSinghal, SameenaMehtab\*and M.G.H.Zaidi**

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**Abstract**

Cholesterol (CHO) electrochemical sensor is an analytical device for conversion of biochemical signal into CHO quantifiable electrical signal. In this study, a novel electrochemical sensor was developed for quantification of CHO based on tungsten carbide (WC) and polyindole (PIN) nanocomposite. Working electrodes have been developed by nanocomposite (NC) of PIN with varying the concentration of WC 5, 10 and 15 (% w/w). Developed electrodes were used to estimate CHO using the square wave voltammetry (SWV) and the stability of the electrode was determined by cyclic voltammetry (CV). Electrical conductivity studies reveals that developed electrode show high conducting behavior and can be employed over wide voltage range. The present investigation reveals a fast, sensitive and low cost WC/PIN NC modified electrochemical sensor for detection of CHO. The developed sensor can also be employed for the CHO estimation in biological systems.

**Keywords:** CHO sensor, Nanocomposite, Conducting polymer, Electrochemical techniques.

**IMPACT OF MICRO AND NANO PLASTICS ON ECOSYSTEM**

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**Abstract**

Plastic is a huge part of everyday life and all over across the globe, from a small tooth brush to the car we drive, everything is made of plastic. But the use of plastic at this extent has become a major environmental challenge in recent years. From poisoning and injuring marine life to disrupting human hormones, from littering our beaches and landscapes to clogging our waste streams and landfills, the exponential growth of plastic is now threatening the survival of our planet. Over 400 millions tonnes of plastic is produced globally every year and 8 million metric tonnes of plastic enters the ocean annually. Discarded plastic enters the marine environment as trash, industrial discharge, or litter through inland waterways etc. The most common plastic polymers that are found in marine environment are (PE) Polyethylene (milk and juice bags, plastic bags, bottles, nettings and drinking straws), (PS) Polystyrene (plastic utensils, food containers) etc. When plastic enters the ocean it degrades into micro plastics (plastic particles under 5mm size). While macroplastics remains a visible problem but micro and nano plastics are invisible which are emerging as moreserious health hazard. These micro and nano plastics are eaten up by aquatic creatures as well as turtles and birds as a result they block their digestive tracts, diminish the urge to eat, and alter feeding behaviour, all of which reduce growth and reproduction output, as a result, some species starve to death. Invisible nature of micro and nano plastics allows them to enter into human bodies by consumption of sea food. Depending on the size these plastic particles are either excreted, get entrapped in stomach and intestinal lining or move freely in body fluids such as blood, thereby reaching various organs and tissues of our body. Sarcastically we can say that the plastic reaches bodies of its producers, humans, by consumption of sea food, closing the full cycle. However to avoid the microplastic intake by marine animals half of the seafood is farmed (e.g. Aquaculture), which could provide less opportunities and time to microplastic exposure. Therefore, use of plastic is a great matter of concern for the human, animals as well as ecosystem.

**Keywords:** Microplastic, Nanoplastic, Marine species, Polymers, Environmental Challenges.



## ELECTROCHEMICAL CHARACTERISTICS OF NANO GRAPHITE/POLYPYRROLE ELECTRODES

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### Abstract

An electroactive electrode was fabricated through depositing nanographite/polypyrrole composite (GPC) over stainless steel (ss) in presence of sulfonated polysulphone binder. For this purpose, GPC was synthesized through cationic surfactant assisted dilute solution polymerization of PPy in presence of nanographite (NG, 400 nm). Formation of GPC was ascertained through diverse analytical methods. Electrochemical behavior of GPC was investigated through cyclic voltammetry (CV), Tafel plots and impedance spectroscopy in KOH (1.0M). GPC has rendered a regular increase in specific capacitance (Cs)@36.01(F/g) up to 0.05V/s with stability of 50 cycles @ 0.1 V/s with improved corrosion resistance to ss at -1.07V and  $4.02 \times 10^{-4}$  A/cm<sup>2</sup>. The present study demonstrates development of nanocomposite based inexpensive electrodes with improved electrochemical, thermal stability and energy storage.

**Keywords:** Polypyrrole, Nanographite, Electrodes, Synthesis, Fabrication, Characterization, Cyclic voltammetry, Impedance spectra

**Theme Area: Green Chemistry Application****GCA 01****ABSTRACT****SIGNIFICANCE OF SYNTHESIS OF SPIRO-FUSED HETEROCYCLIC  
COMPOUNDS: AN OVERVIEW****Mohd Asif, Iqbal Azad, Firoz Hassan, Malik Nasibullah\***

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**Abstract**

Heterocyclic compounds such as isatin, quinoline and their derivatives act as an essential building block in organic synthesis. Dimethylacetylenedicarboxylate is more helpful moiety in the derivatization of heterocyclic compounds due to its significant role in the synthesis of various biologically active compounds. It also plays an important role in the construction of a spiro heterocyclic framework which will be a challenging endeavour for the synthetic organic chemists. Present article gives summary of the advancement in the use of isatin, quinoline and dimethyl acetylenedicarboxylate in the synthesis of various nitrogen-containing spiro-heterocyclic compounds through multi-component reactions (MCRs).

**Keywords:** Heterocyclic synthesis, Isatin, multi-component reactions, spiro-fused compounds.

**SUSTAINABILITY AND GREEN TECHNOLOGY****Shashi Prabha**

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**Abstract**

Various technologies are being invented and used by Human Civilization which supports day to day activities. The adoption of technology is limited and has adverse effects on environment and human civilization. Therefore, scope exists for application of new technologies which are more eco and environmental friendly for supporting day to day activities of the present lifestyle. However, new technologies are more efficient and environment friendly due to increased awareness and recent development in research areas of energy management. These technologies are characterized as green or clean technology. Green technologies involve: energy efficiency, recycling, safety and health concerns, renewable resources, and many more. With the increased efforts in the direction of globalization across the globe also increased the level of competition among various companies in various domains of work and in between governments for the sake of development. The fact that the globalization has taken the world to new heights of development and it has also increased the pace of development in many developing countries. For the sake of globalization and development we are continuously exploiting our mother nature, the environment. People concerned with environment and ecology suggests that if this rate of exploitation continues then the day is not so far when earth and its environment will be not suitable for sustainable life. That's where the term green technology comes into lime light which uses technology in such a way that in one end development which is a result of globalization continues and on the other end the level of negative environmental impact is reduced to its minimum level. This paper will critically review literature on current environmental sustainability practices and the role of green technologies in sustainable development.

**Keywords:** Green technologies, Sustainability.

**GREEN CHEMISTRY AND ITS SCOPE****Akbare Azam**

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**Abstract**

Science achieved medicinal unrest till about the center of twentieth century wherein medications and anti-infection agents were found. The world's sustenance supply likewise expanded massively because of the disclosure of half and half assortments, improved techniques for cultivating, better seeds, and utilization of bug sprays, herbicides and manures. The personal satisfaction on earth turned out to be vastly improved because of the disclosure of colors, plastics, beauty care products and different materials. Before long, the evil impacts of science likewise wound up articulated, fundamental among them being the contamination of land, water and environment. This is caused basically because of the impacts of results of compound businesses, which are being released into the air, streams/seas and the land. The utilization of harmful reactants and reagents additionally exacerbate things. The contamination achieved such levels that various governments made laws to limit it. This denoted the start of Green Chemistry by the center of 29th century. Practical Chemistry is an idea which adds to accomplishing various objectives of the 2030 Agenda for Sustainable Development (SDGs). It is based, among others, on the standards of "green science" and has interfaces with significant points, for example, asset protection, squander the board, word related security, worker and purchaser wellbeing, and nourishment. Supportable science joins environmentally suitable arrangements with financial accomplishment under thought of societal and social requests.

**Keywords:** Sustainable chemistry, Greenchemistry, Hybridvarieties, Compound businesses.

**BIOFERTILIZERS AND THEIR ROLE IN THE SUSTAINABLE AGRICULTURE**

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**Abstract**

The green revolution no doubt brought the tremendous changes in the field of agriculture and farmer's life but with the insufficient concerns for sustainability. Chemical fertilizer acted as a fuel which made it possible to supply crops with extra nutrients and, therefore, increase yield. Due to its immediate effect and better yield, it made the farmers so dependent on chemical means that they tended to overuse and misuse them. Excessive uses of chemical fertilizers and pesticides in the crop field not only deteriorate the quality of soil but also highly degrade the environmental and human health. The government of India has been also trying to promote an improved practice involving use of biofertilizers along with the chemical fertilizers as it act as a beneficial strategy globally in terms of the growing demand for safe and healthy food and long term sustainability. The present chapter therefore focuses on the agricultural as well as societal benefits of using biofertilizers and intervenes to set efforts for the promotion of biofertilizers in crop production, being precious gift of nature and having great potential as supplementary, renewable and eco-friendly source of plant nutrients and an important component of Integrated Plant Nutrient System.

**Keywords:** Biofertilizers, microorganisms, soil, sustainability.

**USE OF SURFACTANTS AS ELUENTS IN SOIL THIN LAYER  
CHROMATOGRAPHY OF HEAVY METALS: A GREEN APPROACH TO  
CHROMATOGRAPHY**

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**Abstract**

Surfactants as green eluents in soil thin layer chromatography (soil TLC) have been used to investigate the separation and migration behaviour of heavy metal ions. These green eluents exterminate or lessen the use of toxic volatile organic eluents and protect the environment from further decay. Surfactant-assisted soil TLC involving the use of well powdered natural soil / soil mixed with cellulose as the stationary phase and aqueous solution of surfactants/mixed surfactants as mobile phase passes to classify our developed methods as Green. The results obtained for identification of certain heavy metal ions ( $Zn^{2+}$ ,  $Cd^{2+}$ ,  $Cu^{2+}$ ,  $Ag^{+}$ ,  $Au^{2+}$ ) after separation from their multicomponent mixtures will be discussed. The developed methods facilitate to identify heavy metal cations present in sample matrices. The use of surfactants in eluents stimulates the resolution of coexisting metal cations, given that novel possibilities for their simultaneous separation from multicomponent mixtures.

Keywords: Soil thin layer chromatography, Heavy metals, Surfactants, Biosurfactants, Green eluents

**ECO-FRIENDLY DEVELOPMENT THROUGH GREEN CHEMISTRY****Rajesh Kumar<sup>1</sup>, N.U Siddiqui<sup>2</sup> and AnoopKumar<sup>2</sup>**<sup>a</sup>Deptt. Of Chemistry, SatyapalSingh Mahavidyalaya Shahjahanpur, Uttar Pradesh-242001<sup>b</sup>Deptt. Of Chemistry, G.F. College Shahjahanpur, Uttar Pradesh, India-242001

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**Abstract**

With the help of chemistry many organic compounds were synthesized such as drug, dye, antibiotics, plastics and other material which increase the quality of life on earth and food supply is also increased by the discovery of hybrid variety of seeds, improving method of forming, insecticides, herbicides and fertilizers. Soon the hazardous effect of chemistry pronounced the pollution of land, water and atmosphere. This effect is caused by the products of chemicals industries which are being discharge in to the river land and atmosphere. As on today maximum pollution in atmosphere is caused by numerous chemical industries. Green chemistry design chemical processes to less harmful to environment and human health. Green chemistry informed that manufacturing process such a way that the waste products are minimum, select safer chemicals, obtained product should be bio-degradable and atom economy should be high.

**Key words:** Green chemistry, safe chemicals and Eco-friendly.

**EXAMINING THE IMPRESSION OF GREEN MANAGEMENT ON OPERATION  
FUNCTIONS: CASE OF A BUSINESS**

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**Abstract**

Green management is a paradigm that includes improving environmental awareness, using energy resources and eco-friendly technologies, reuse of wastes, and recycling activities starting from production activities of businesses to packaging and delivering to consumers. Businesses have now become aware that environment must be preserved and tended towards green management as a result of destructed and demolished environment, and the effect of hunger, scarcity, global problems despite developed societies. Businesses have switched from traditional management mentality to environment-oriented green management. The objective of green management is to ensure operation activities be performed in accord with environment, to preserve environment in business objectives, visions and goals as well as operation functions, to enable continuous development, and to select technologies in accordance with sustainability principle. The aim of this study was to examine business's success in green management, activities and green management vision. The present study discussed a business that uses green management with case study, a qualitative research method. It is concluded that social responsibility acts on business's awareness to green management; businesses provide their personnel with orientation training on green management practices; Protect the environment by applying green management; the business raises consumer awareness, focusing on being environmentally friendly in their ads.

**Keywords:** Green management, Businesses, environmental,eco-friendly, global problems.



**MIXED MICELLE FORMATION OF GEMINI SURFACTANT IN THE PRESENCE OF  
ADDITIVES AND ITS IMPORTANCE IN GREEN CHEMISTRY**

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**Abstract**

Gemini surfactants are an interesting class of surfactants whose ability to strongly reduce surface tension makes them potentially useful as detergents. They are made up of two amphiphilic moieties connected by a spacer group of varied nature at or near the polar head groups. Mixed micellization and interfacial properties of cationic gemini surfactant butanediyl- 1, 4-bis(dimethyldodecylammonium bromide) (12-4-12) have been studied in the presence and absence of various alcohols (1,2-butandiol, 2-methyl-1-butanol, 2-ethyl-1-butanol, 2-butene-1,4-diol). Parameters studied include cmc (critical micelle concentration),  $C_{20}$  (concentration required to reduce the surface tension of the solvent by 20 mN/m),  $\Gamma_{\max}$  (maximum surface excess concentration at air/solution interface), and  $A_{\min}$  (minimum area per surfactant molecule). These parameters indicate mixed micellization between the surfactants and alcohols. The theories of Rosen and Rubingh have been used to investigate the interactions between the constituents at the interface and in the micellar solution.

**Keywords:** Alcohols, gemini surfactant, mixed micelle, cosmetics, CMC.

**GREEN CHEMISTRY IN PHARMACEUTICAL INDUSTRY****Babita Chaudhary**

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**Abstract**

Green Chemistry i.e. sustainable chemistry is a chemical technique that encourages the design of chemical products and procedures that reduces the use and generation of toxic and hazardous chemical substances. Green Chemistry plays an important role in pharmaceuticals in developing innovative methods of drug production which are less toxic and more useful with minimum side effects. The principles of Green Chemistry can be achieved by the use of renewable, eco friendly, harmless reagents, solvents and catalysts during the manufacture of medicine. Development of pharmaceutical products by use of Green Chemistry can result in reduction of waste generation and it can play an important role to eliminate health related issues due to use of organic solvents resulting environmental waste generation. Pharmaceutical companies can improve the environmental performance with utilizing Green Chemistry. Green Chemistry can save companies money by reducing the need for costly chemicals, reagents and solvents, lowering insurance and legal costs, reducing waste disposal costs and saving energy.

**Key Words:** sustainable, hazardous chemical substances, pharmaceuticals, eco-friendly.

**APPLICATIONS OF GREEN CHEMISTRY IN SUSTAINABLE DEVELOPMENT****Pushpraj Singh**

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**Abstract**

The chemical industry plays a fundamental role in sustaining the world economy and underpinning future technologies and scientific advances in new materials, less toxic products, renewable energy sources, environmental protection, industrial processes with energy efficiency and renewable raw materials. Green Chemistry (GC) or Sustainable Chemistry aims, under greater societal expectations, for a sustainable global future of the planet Earth, for the design of chemical products that eliminate the use of hazardous substances for man and the environment. In this respect Green Chemistry fields initiated in the 1990s are rapidly developing technological innovations providing the most environmentally suitable solutions for a sustainable development of future science and technology. We have to develop materials that will aid in the infusion of green chemistry into the curriculum such as green chemistry laboratory experiments and short courses on green chemistry. This article presents a brief description on green chemistry principles and its developments.

**Keywords:** Green chemistry, sustainable development, designing safer solvents, designing safer chemicals.

**GREEN CHEMISTRY FOR SUSTAINABLE FUTURE****Sushil Kumar<sup>1</sup> and Himshikha Yadav<sup>2\*</sup>**<sup>1</sup>Associate Prof., Deptt of Zoology, Govt PG College, Bisalpur Pilibhit<sup>2</sup>Asst. Prof., Deptt of Botany, VRAL Govt Mahila Degree College Bareilly

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**Abstract**

Hundreds of tonnes of hazardous waste are released to the air, water, and land by industry every hour of every day. The chemical industry is the biggest source of such waste and the number of agents considered toxic is continuously increasing due also to a series of more restrictive laws. The term Green Chemistry was coined in the 1990s, to bring focus to an increasing interest in developing more environmentally friendly chemical processes and products. In this term the Green Chemistry represents the most concrete answer of the scientific community to the pressing environmental needs and sustainability. According to IUPAC, **Green chemistry** is an area of chemistry and chemical engineering focused on the designing of products and processes that reduce or eliminate the use or generation of substances hazardous to humans, animals, plants, and the environment.

**GREEN CHEMISTRY & SUSTAINABILITY****Sarika Sharma**

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**Abstract**

Green chemistry is an approach to the design, manufacture and use of chemical products to intentionally reduce or eliminate chemical hazards. It focuses on the reduction, recycling/ elimination of the use of toxic and hazardous chemicals in production processes by finding creative, alternative routes for making the desired products that minimize the impact on the environment. Sustainable economic growth requires safe, sustainable resources for industrial production. This article describes an introductory account of the basic tenets on which the concept of the Green Chemistry is based.

**Keywords:** Green chemistry, environmental chemistry, feedstock, analytical chemistry, sustainability, metathesis

**GREEN CHEMISTRY: A GREEN TECHNOLOGY AND SUSTAINABLE CHEMISTRY****Monal Singh and Dhananjay Singh**

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**Abstract**

Green chemistry is a design of chemical products which reduce or eliminate the hazardous substances. Green chemistry and sustainability are both side of the coin. Implementation of green chemistry principles helps to attain environmental, economic as well as social goals. Development of chemicals, polymers, dyes, fertilizers, pesticides, fibres, pharmaceuticals materials have drastically change human lives. The usages and production of these chemicals may involve reduced waste, products, non toxic components and improved efficiency. Green Chemistry an emerging technology that could make industrially important and more ecofriendly than conventional reactions. Green technology prevent waste less hazardous chemical synthesis, safer solvents and reaction conditions, increase energy efficiency, design chemicals and products to degrade after use and minimize potential for accidents. Green Chemistry, design chemical product and processes to reduce their intrinsic hazards.

**Keyword:** Intrinsic hazards, Ecofriendly, Economic efficiency.

**A REVIEW ON INDIAN METRO RAIL PROJECT AND THEIR GREEN INITIATIVE  
FOR ENVIRONMENT SAFETY**

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**Abstract**

India is a fast growing economy in the world. Development of an economy at the stake of environment degradation is not sustainable. Therefore we have to think development without disturbing our habitat. Urban metro in India is one the example of such type of development. Metro has been instrumental in ushering in a new era in the sphere of mass urban transportation in India. The swanky and modern Metro system introduced comfortable, air conditioned and eco-friendly services for the first time in India and completely revolutionized the mass transportation scenario. We will review on the Indian metro rail projects in this paper in detail.

**GREEN SYNTHESIS OF BIOLOGICALLY ACTIVE SPIRO (CYCLOHEXANE-1':2-THIAZOLIDIN)-4-ONE DERIVATIVES**

**Kahkashan Begum**

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**Abstract**

Thiazolidinone derivatives are known to have various biological properties<sup>1</sup>. Similarly 1,3,4-thiadiazole derivatives are well known for their herbicidal, fungicidal and bactericidal properties<sup>2</sup>. Some cyclohexane spiro imidazoline have been reported as antihelminthicides<sup>3</sup> (a). There is a record when a thiadiazole ring is coupled with another heterocyclic system compounds of better biological activities are obtained (b). Keeping all these observation in mind it was thought of interest to unite 1,3,4-thiadiazole system with 4-thiazolidinone to see how much this combination would sum up towards physiological properties in the title compound (IV). In order to get some biologically active compounds a cyclohexane ring, a thiadiazole ring and a thiazolidinone ring all were combined in one compound with the help of some classical methods. But in new synthesis the main aim to synthesize bioactive compound was associated with replacement of unhealthy solvent with green solvent. 2-amino-5-aryl-1,3,4-thiadiazole was synthesized by the procedure of Maffii et.al<sup>5</sup>. The obtained compound when refluxed with cyclohexane provided 2-(cyclohexylidene ) amino-5-aryl-1,3,4- thiadiazole. Finally the treatment of newly formed compound with mercaptoacetic acid furnished the desired compound 3-[5-aryl-(1,3,4)-thiadiazol-2-yl] spiro (cyclohexane-1:2'-thiazolidin)-4-one.

**Key Words:** Heterocyclic Fungicides, Herbicides, Thiazolidinones, Thiadiazoles.



**GREEN CHEMISTRY: A TOOL FOR SUSTAINABILITY AND SUSTAINABLE  
DEVELOPMENT**

**Shabana Sajid**

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**Abstract**

Green chemistry, which was established about two decades ago, has attracted much attention. It reflects the efforts of academia and industry to address the challenges related to sustainable development of the chemical industry, and continuous progress is being made, both in academia and industry. Briefly, green chemistry is the utilization of a set of principles to reduce or eliminate the use or generation of hazardous substances in the design, manufacture and applications of chemical products. Green chemistry is a multidisciplinary field and covers areas such as synthesis, solvents, catalysis, raw materials, products and efficient processes, as shown in figure.

**Keywords:** Green chemistry, Environmental sustainability, Sustainable development.

**SIGNIFICANCE OF AFFORESTATION A GREEN PROSPECTIVE****Jamil Ahmad Khan**Department of Political science, G.F. College (Affiliated to MJP Rohilkhand University),  
Shahjahanpur, U.P., India**Abstract**

Forests have long been seen as important sources for many useful things including clean drinking water. Forested catchments supply a large proportion of total water used for domestic, agricultural and industrial requirements. Trees and plants recycle moisture present in the atmosphere through transpiration to increase the rainfall. The significance of forest and trees to rainfall and water supply include, improvement of water cycle, reduction in runoff, improve the replenishment of the water table, filtration of pollutants, control of floods and regulation of stormwater. Now-a-days in spite of their importance, forests face threats due to indiscriminate exploitation. Therefore, it is required for sustainable water supply and rainfall through natural regeneration by land protection, aggressive afforestation.

**Keywords:** Afforestation, environmental friendly, water cycle, natural resource.

**GCA 18****ABSTRACT****SYNTHESIS AND BIOLOGICAL CHARACTERIZATION OF TI (III), V (III), VO (IV), MOO (V), FE (II) AND FE (III) COMPLEXES OF BENZIL- 2,4-DINITROPHENYL HYDRAZONE P-TOLUIDINE.****Gulshan Rastogi<sup>1</sup> and Rajkamal Rastogi<sup>2</sup>**<sup>1</sup>Department of Chemistry

AryaMahila P.G. College, Shahjahanur

<sup>2</sup>Basic Education, Department Lakhimpur Kheri.**Abstract**

The complexes of Benzil-2, 4-dinitrophenyl hydrazone-p-toluidine with Ti(III),V(III), VO(IV),MoO (V), Fe(II), Fe(III) have synthesized and characterized by elemental analysis, magnetic measurement data, molar conductance, TGA,UV-visible and IR spectra data. The complexes of Ti (III), V (III), Fe (II) and Fe (III) have octahedral geometry while VO (IV) and MoO(V) have distorted octahedral geometry due to the presence of M=O moiety.

**Keywords:** TGA, Spectroscopy, Synthesis, Schiff base.**GCA 19****ABSTRACT****Sustainable Green Chemistry Potential and Its Applications in Daily Life: An Overview****J.N. Maurya, Sanjay Garg and Alok Srivastava**

Department of Plant Science

M.J.P ROHILKHAND UNIVERSITY, U.P, INDIA

**Abstract**

Sustainable industrial activities need to use raw materials, water and energy in a way that does not harm the environment and be economically viable. Establishing a balance in the use of natural resources, economic growth and environmental conservation is possible through the introduction of a green chemistry process whose task is to design such chemical processes and products that are harmless to human health and the environment. Every choice and analytical attitude has consequences both in the final product and in everything that surrounds it. The future of green chemistry as well as our future and the environment is also contemplated in this work. The impacts of green chemistry on environmental, population, analyst and company are described in this article.

**Keywords:** Green chemistry, Environment, human health

**GREEN CHEMISTRY AND ITS APPLICATION IN SUSTAINABLE DEVELOPMENT:  
AN OVERVIEW****Mohammad Asif Hassan**

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**Abstract**

Green chemistry also called sustainable chemistry is an area of chemistry and chemical engineering which mainly focused on designing products and process that minimizes or eliminates the use of hazardous substances that affects our environment. Green chemistry focusses on the environmental impact of chemistry, including reducing consumption of non renewable sources and technological approaches for preventing pollution. The overarching goals of green chemistry namely, more resource efficient and inherently softer design of molecules, materials, products and process can be pursued in wide range of contexts. Green chemistry discusses the engineering concept of pollution prevention and zero waste both at laboratory and industrial scales. It encourages the use of economical and eco-compatible techniques that not only improve the yield but also bring down the cost of disposal of wastes at end of chemical process.

**Key Words:** Green Chemistry, Hazardous substances, Waste, Pollution, Prevention.

**Theme Area: Sustainability and Environment Safety****SES 01****ABSTRACT****ENVIRONMENTAL IMPACT ASSESSMENT FOR BRICK EARTH MINING OF  
MINOR MINERALS IN INDIA****Faizan Anwer<sup>1,2\*</sup> and Mohammad Rehan<sup>2</sup>**<sup>1</sup>M. Tech (Environment Engineering) from Jamia Millia Islamia, New Delhi<sup>1</sup>MBA (Finance & International Business) from Jamia Millia Islamia, New Delhi<sup>2</sup>Swami Shukdevanand Law College (Mahatma Jyotiba Phule Rojilkhand University),  
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**Abstract**

Since the dawn of civilization, construction industry has played a vital role in architectural and infrastructural development. The exponential spread of infrastructural growth leads to the extensive use of bricks for building purpose. The manufacturing process of bricks essentially involves the mining of minor minerals like soil and sand. Soil mining leads to the depletion of fertile upper stratum of the earth crust along with a wide spectrum of micro flora and fauna. Soil mining on a large scale may change the land use pattern and adversely affects the agricultural activities. A large amount of coal is consumed in the firing of bricks that results in the emission of various harmful gases in the atmosphere. There is no or very less generation of waste and no liquid effluents are generated at the mining site. Bricks have been considered to be the most popular construction material due its high strength. This is the high time for the assessment of different alternatives of brick earth, expected damage to various matrices of the environment and the health impacts on various living organisms. Previously there was no provision of environmental impact assessment of soil mining for the purpose of brick manufacturing. From January 2016, it is mandatory for all the manufacturing units in India to obtain environmental clearance from the concerned authorities. It is a matter of great concern whether the implementation of such legal constraints will protect the treasurable environment or it will hinder the ease of business.

**Keywords:** Health, Environment, Soil Mining, EIA Notification

**INSECT AND THEIR ROLE FOR SOCIETY****Mohd. Shoeb**

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**Abstract**

Both human and insects societies depends on complex and highly coordinated infrastructure systems, such as communication networks, transportation network. Like human draw infrastructure, those of social insects are regularly subject to disturbed such as natural disasters, breaks in the transportation networks. There is no deliberate planning or centralized control system. Individual insect make any decision based on local information. We bring together literature resilience in three key social insects infrastructure system. We described how systems differentially invest in three pathways to resistance or reconstruction. We suggest that investment in particular resistance pathway is related to the severity and frequency of disturbance. Human infrastructure management might therefore learn from social insect researchers, who interns can make use of the mature analytical and simulation tools developed for Human infrastructure.

**WILLIAM WORDSWORTH'S NATURE POETRY: AN ECOCRITICAL ANALYSIS**

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**Abstract**

Wordsworth is a romantic poet. He is a poet of nature. Poets, novelists and many play writers have portrayed nature and natural beauties in their own ways. They have highlighted many issues of didactic, mystic and philosophic level. As ecological changes in the environment occur, the policy based on nature also have been affected and lost their charms and attraction. The interpretation of the works incorporating nature has also undergone a drastic change due to the introduction of Ecocriticism in literature. Ecocritical perspective has shown the healing influence of nature and also the destruction wrought on nature by the growing materialism. Wordsworth has also highlighted the negative impact of materialism on man's love for nature as is evident from his poem "The World is too much with us". This paper intends to analyze Wordsworth's nature Poetry. Wordsworth is very well known romantic poet of nature. So he and his work became the subject of criticism. Ecocritical studies have started in 1990s to analyze the nature and his philosophy of life of human beings. He believes that Nature is superior to human beings.

**Key word:** Ecology, Ecocriticism, Nature Poetry, Materialism.

**SPECTROPHOTOMETRIC AND SPECTROSCOPIC STUDIES ON HYDROGEN BONDED CHARGE TRANSFER COMPLEX BETWEEN PYRAZOLE AS A DONOR AND SALICYLIC ACID AS ACCEPTOR AT DIFFERENT TEMPERATURES**

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**Abstract**

A new charge transfer complex (CTC) between pyrazole as donor and salicylic acid as acceptor was synthesized and characterized by using various techniques such as FTIR, UV-visible spectroscopy and X-ray crystallography. Further, stoichiometry was ascertained from UV-visible spectroscopy at various temperatures between 25°C-45°C by making equimolar proportion using the straight-line method known as Benesi-Hildebrand equation, found to be 1:1 in our study. Different thermodynamic and physical parameters were evaluated, for example, oscillator strength ( $f$ ), transition dipole moment ( $\mu_{EN}$ ), molar extinction coefficient ( $\epsilon_{CT}$ ), energy of interaction ( $E_{CT}$ ), and stability constant ( $K_{CT}$ ). Other parameters like Gibbs free energy ( $\Delta G^\circ$ ), entropy ( $\Delta S$ ) and enthalpy ( $\Delta H$ ), were determined utilizing condition given by Van't Hoff. TG/DTA studies reveal information about the stability of the CTC as a function of temperature. In addition, investigation of the intermolecular interactions that stabilize the crystal packing have been performed by using Hirshfeld surfaces and their related 2D fingerprint plots. Molecular docking studies have likewise been finished with total binding energy of  $-198.53 \text{ kcal mol}^{-1}$  with B-DNA.

**Keywords:** CT complex, crystal structure, entropy, free energy, formation constant, molecular docking.



**FOREST PROTECTION ACTS IN BRITISH INDIA: AN OVERVIEW****Tanveer Husain**

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**Abstract**

Forests are the major natural resources and are also recognized as a colourful expression of nature. They are also recognized as guardians and protectors of the wildlife of the country. Forests are valuable not only due to his botanical use but also for its recreational and scenic beauty that gives glory and attraction to many places in North-east of India as well as in other countries. Forests always add to the agriculture of the place it was situated whether it is in the terms of fertility of the soil, prevention of soil erosion, and promote perennial stream flow in rain-fed rivers. They shelter wild animals, preserve gene pools, and protect the tribal population. Thus, forests help in maintaining the ecological balance.

**IMPACT OF DEFORESTATION AND SOIL EROSION ON CLIMATE CHANGE****Seema Anand**

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**Abstract**

Climate change has become one of the prime issues threatening the sustainability of world's environment. It has also effects on life ability, health and economy of the globe, such as rise in sea level, to rise as polar ice caps, glaciers begin to melt, drought, floods, terrible storms, many more hot days, disease like malaria and dengue, change in crop production etc. Climate change may soon turn critical in India. Mining, Deforestation etc becomes the cause of Climate change. Mining wreaked havoc on the mountain ranges, such as Aravali hills in India. Reckless mining and chocking up of the natural rain water supply due to massive colonization around the lakes has completely shriveled up the water bodies. The priceless resource of water can be considered limitless only if used in a sustainable manner. Soil erosion has a direct impact on climate and society, as it decreases the productivity of ecosystems and changes nutrient cycles. Climate change has led to erratic weather behavior and altered the nature of soil and water, making occupation like farming, less susceptible. Climate change is no more an environmental concern. It has emerged as the biggest developmental challenge for the planet. Impact of climate change on food security in India is already under threat due to various reasons. Local forests on the global climate, both are common property resources. Through soil and water conservation, adaptation of climate change is possible. Organic farming may be a brilliant idea to adapt climate change. We, women may play a powerful role to save our climate, environment, forests and economy. Human activities can also increase the warming of climate. In this article, I'm trying to cast light on such issues.

**Keywords:** Environment, Economy, Climate change, Food security, Health.

**A CASE STUDY-THE RIVER GANGA AT KANPUR**

**K.K. Ojha**  
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**Abstract**

This study deals with the statistical analysis and study of water quality index to dissolve oxygen (DO) of water in U.P. the study has been suitability for drinking, irrigation and industrial purpose, this study reveals that people dependent on water sources of the study area are prone to health hazards of contaminated water and quality management to DO & BOD urgently needed. As per Indian standards (IS-1172) the requirement of water per person perday is 135 ltrs. (about 9 buckets) for hygienic living.

**Keywords:** water quality Index, DO, BOD.

**ENVIRONMENTAL HAZARDS AND DISASTER IN INDIA****NaseemUsshan Khan\* and Naveen Jaiswal**

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**Abstract**

Hazards originate from interplay of physical, biological, social system. India prone to natural disaster- earthquakes floods, cyclones and droughts. Our planet earth is an ever dynamic evolving system with complex interactions of internal and external process. The internal process includes earthquakes, volcanic, while, the external process includes flood, hurricanes, tornadoes, and radioactivity. Every hazard has a different space and time characteristic, which has been summarized in tabular form (Table 1). The natural hazards are related to climate, water and geological causes. Besides natural, the other hazards, as recognized by High Powered Committee on Disaster Management relate to chemical, Industrial, nuclear, biological and accidental disaster. Over the last two decades the natural disasters have claimed over three million lives and adversely affected 800 million people worldwide with 90 percent of the victims being from developing countries. In India, there are a total of 593 districts, of which 199 are most disaster prone. Three major natural hazards, namely earthquakes, cyclones and floods are known from times immemorial. India has been affected by these hazard However, the listing of the major occurrence of these hazards is available only for the last about 200 years.

**BIODIVERSITY: LIFE INSURANCE FOR SUSTAINABLE DEVELOPMENT****Himshikha Yadav**Botany Department, V.R.A.L. Govt. Mahila Degree College, Bareilly-243005, Uttar Pradesh,  
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The variety of life on Earth, its biological diversity is commonly referred to as biodiversity. The number of species of plants, animals, and microorganisms, the enormous diversity of genes in these species, the different ecosystems on the planet, such as deserts, rainforests and coral reefs are all part of a biologically diverse Earth. The 1992 Convention on Biological Diversity (CBD) carries an internationally accepted definition of biodiversity as “the variability among living organisms from all sources, inter alia, terrestrial, marine and other aquatic ecosystems and ecological complexes of which they are part, this includes diversity within species, between species and of ecosystems”. Biodiversity is a key factor in determining sustainability of any ecosystem; including Earth – home planet of Humanity. An ecosystem is a community of living organisms in conjunction with the non-living components of their environment, interacting as a system. These biotic and abiotic components are linked together through nutrient cycles and energy flows. Energy enters the system through photosynthesis and is incorporated into plant tissue. By feeding on plants and on one-another, animals play an important role in the movement of matter and energy through the system. By breaking down dead organic matter, decomposers release carbon back to the atmosphere and facilitate nutrient cycling by converting nutrients stored in dead biomass back to a form that can be readily used by plants and other microbes.

**ANALYTICAL STUDY OF PHYSICO-CHEMICAL WATER QUALITY PARAMETERS OF RIVER DEHAHA (DEVAAHUTI GANGA) AT DISTRICT PILIBHIT (U.P.), INDIA****Suneet Kumar Sahni**

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**Abstract**

Water pollution is a major global problem which causes very harmful effects to environment, human beings and ecosystem. Healthy soil, pure water and clean air are the main requirements for life. The present analytical study of physicochemical parameters has been carried out for the water quality assessment of river Devaha (Devahahuti Ganga) at district Pilibhit. The water samples were collected from three different sites: Doonydam (I), post merger site of Khakra and Devaha rivers (II) and site under Bisalpur-Bareilly highway bridge (III) into three seasons as summer, rainy and winter and the physicochemical parameters like Total hardness, Total dissolved solids (TDS), Dissolved oxygen (DO), Biological oxygen demand (B.O.D.), Chemical oxygen demand (C.O.D.), Chlorides, Metals like Sodium, Magnesium, Calcium, Lead were assessed. The observations reveal that the upward stream of river shows good quality parameters; however, at the sites (II) and (III), river shows poor water quality parameters and becomes more polluted in winter season.

**Keywords:** Physicochemical parameters, Water pollution, River Devaha, Pilibhit.

**WATER SECURITY: FROM CHALLENGES TO SOLUTION****Archana Pandey\***

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**Abstract**

Water is the key element of life on Earth. Its uses can be divided into three broad categories; water for life, water for citizen and water for development. Water for life is usually given the highest priority because it is necessary for the survival of human beings and other living beings as well. This function makes it necessary to guarantee the sustainability of the eco system so that a minimum quantity of good quality water is accessible to all. Water for citizen is related to the social rights of the community and individual concern with the provisions of water for public institutions and public health. This function takes into consideration the interest of the society as a whole including values of social cohesion and equity. Water for development is concerned with economic activities which fulfill the interests such as irrigation for agriculture, hydroelectricity for industry. Nowadays, water for development consumes the largest quantity of water and is largely responsible for creating its related problems i.e., scarcity and pollution. Sustainable development will not be achieved without a water secure world. A water secure world integrates a concern for its intrinsic value of water with a concern for its use of human survival and well-being. A water secure world harnesses water productive power and minimizes its destructive force.

**BIO-ORGANIC FARMING****Deepshikha**

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**Abstract**

The big challenge to ecosystem is the use of chemical fertilizers in farming which is destroying the ecosystem and creating a big imbalance in nature. The principles of bio-organic farming developed in the 1950s were based on the close interaction of the microbiological processes of the land, plants and animal life, in order to protect nature and exploit its natural order for the purposes of agriculture. Through the active preservation of nature and its species, environmental pollution is prevented and the welfare of farm animals is protected, thus ensuring that bio-organic farming makes a valuable contribution to global energy solutions, producing valuable, healthy food.

**Keywords:** Chemical fertilizer, Ecosystem, Natural imbalance



**ELECTROCHEMICAL SENSOR FOR PESTICIDE ESTIMATION IN APPLE****Pragati Joshi<sup>\*</sup>, Sameena Mehtab, M.G.H. Zaidi**

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**\*E-mail:** pragatijoshi91@gmail.com**Abstract**

Apple is one of the highly consumed fruit and also a major source of pesticide carrier to human health. Cyhexatin, penconazole, sulfur, azinphos-methyl, chlorpyrifos, imidacloprid, pirimicarb, triazamate and vamidothion are used as pesticides in apple. These pesticides generate toxic effects by inhibiting acetylcholine esterase activity that generates serious human health and environmental concerns so its trace level estimation is required. In the present investigation using chlorpyrifos as the model compound, the conditions were optimized and a sensitive electrochemical sensor has been developed. Surface morphology, electrical and electrochemical behavior of electrodes were analyzed through scanning electron microscopy,  $\sigma$ DC, cyclic voltammetry, square wave voltammetry and electrochemical impedance spectroscopy in PBS (0.1 M, pH 7.4). The result shows that the developed system can detect chlorpyrifos residue upto  $10^{-8}$  mol/L limits of quantification.

**Keywords:** Chlorpyrifos, Cyclic Voltammetry, Electrochemical Sensing, Organophosphorus, Square Wave Voltammetry.

**CORROSION PROTECTION OF COPPER BY  
POLYSULPHONE/POLYACRYLONITRILE BLENDS**

**Bharat Bhushan Upreti<sup>\*</sup>, Anjali Kaintura, Prabhat Chandra, Sameena Mehtab, M.G.H. Zaidi**

Department of Chemistry, College of Basic Sciences and Humanities, G.B. Pant University of Agriculture and Technology, Pantnagar-263145, Uttarakhand, India

<sup>\*</sup>E-mail: bharatupreti05@gmail.com

**Abstract**

Polysulphone/polyacrylonitrile blends (PPBs) were synthesized through reactive blending of polysulphone (PSF) and polyacrylonitrile in N-methyl pyrrolidone (NMP) under microwave irradiation at 75W over 20 min in series. Monitoring of reactive blending process was done through 2,2'-azobis isobutyronitrile ( $6.0 \times 10^{-4}$  mol/dl) initiated insitu polymerization at varying concentrations (mol/dl) of acrylonitrile from  $9.0 \times 10^{-3}$  to  $21 \times 10^{-3}$  with PSF (50%, W/V, 10 ml) in NMP. Characterisation of PPBs were done through diversified spectral, thermal, microscopy and electrochemical methods. Electrochemical impedance spectra (EIS) and DC polarization in sodium chloride (0.25M) were used to evaluate the PSF for the corrosion protection of copper. Electrochemical data reveals the enhanced corrosion protection of PPBs over PSF for copper. Generally, coating of PPBs displays marginal delamination at rate of 0.53mm/yr in 29h. This work illustrates the corrosion protection of copper through coating of PPBs and in the same manner this can be executed for protection of other metals using polymer blends in saline media.

**Keywords:** Irradiation, Microscopy, Polymerization

**CLIMATE CHANGE AND ITS EFFECT ON RUNOFF OF THE STREAM: A CASE  
STUDY OF THE BLUE NILE SUB-BASIN, ETHIOPIA**

**Mushir Ali\*, Mekuanint E. Tamir**

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Ethiopian Civil Service University, Addis Ababa, Ethiopia

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**Abstract**

One of the most severe consequences of climate change is the alteration of the hydrological cycle. Change in the hydrological cycle due to climate conditioned by climate drivers of change-precipitation, temperature, and surface drivers-spatial land covers. These drivers are interwoven having effects particularly on developing countries like Ethiopia. However, future climate change is not clearly quantified. This study has aims to quantify effect of climate change and land covers on stream flow of Gilgil Abbay catchment. For the detail study two representative concentrations of pathways (RCP 4.5 and RCP 8.5) of future climate scenario in near term (2010-2039), mid-century (2040-2069), end century (2070-2099); and climatological baseline period was selected to analyze climate change. Landsat image of the year 1986 and 2015 were processed with the help of remote sensing. And GIS software is used to identify the dynamics of the study area and thereby its effect on catchment runoff. Moreover, SWAT 2012 physical based semi-disturbed hydrological model was applied to simulate baseline hydrological process and to quantify the effect of climate change on surface runoff. The results of the study shows that mean annual maximum and temperature had increasing trend in all time period while precipitation did not have a clear trend. Due to effect of climate change mean annual surface runoff of Gilgel Abbay catchment anticipated to increase by 0.5% in 2025, 3.8% in 2055 and 10.9% in 2085 for 8.5. The runoff also increased by 3.53% mean annually. Spatial land use planning is required to slim down effect of climate.

**Keywords:** Catchment, climate change, precipitation, stream runoff, temperature

SCREENING OF ANTIOXIDANT POTENTIAL OF ALPINIA GALANGA AND  
SYZYGIUM AROMATICUM

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**Abstract**

Excessive free radical generation overbalancing the weight of their removal leads to oxidative stress. Antioxidants are compounds that hinder the oxidative process and thereby delay or suppress oxidative stress leading to a growth of interest to manipulate such compound. Perspective direction of investigation includes the antioxidant potential of two herbs namely *Alpinia galanga* (galangal) and *Syzygium aromaticum* (clove) in vitro studies. Female wistar rat were administered with Hetapotoxin thioacetamide (TAA) in the peritoneal cavity in order to induce oxidative stress. Parameters such as lipid peroxidation and reduced glutathione were estimated to study the oxidative and antioxidative potential of the mentioned compounds.

**Keywords:** Antioxidant, Oxidative, Hetapotoxin thioacetamide (TAA).

**SYNTHESIS AND BIOLOGICAL EVALUATION OF SOME SUBSTITUTED AMINO THIAZOLE DERIVATIVES****Akeel Ahamad**

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**Abstract**

Condensation of acetophenone with thiourea in presence of halogen (Iodine) gives 2-amino-4-phenylthiazole. 2-Amino-4-phenyl-5-phenylazothiazole was prepared by coupling of phenyldiazonium chloride with 2-amino-4-phenylthiazole. A series of amide can be synthesized by treatment of appropriate substituted acid chlorides with compound using pyridine as solvent. All the synthesized compounds are characterized by the combination of elemental analysis and standard spectroscopic method. They are screened for anti-bacterial activity against *Escherichia coli* and *Staphylococcus aureus* as well as screened for antifungal activity against *Aspergillus niger* and *Aspergillus oryzae* by cup plate method at 1µg/mL concentration in DMF. All the synthesized compounds showed moderate to good microbial activity.

**Keywords:** Amino thiazole derivatives, biological activity, microbial activity, characterization.

**CORROSION PROTECTION OF COPPER BY  
POLYSULPHONE/POLYACRYLONITRILE BLENDS**

**Prabhat Chandra, Anjali Kaintura, Bharat Bhushan Upreti, Sameena Mehtab and M. G.  
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**Abstract**

Polysulphone/polyacrylonitrile blends (PPBs) were synthesized through reactive blending of polysulphone (PSF) and polyacrylonitrile in N-methyl pyrrolidone (NMP) under microwave irradiation at 75W over 20 min in series. Monitoring of reactive blending process was done through 2,2'-azobis isobutyronitrile ( $6.0 \times 10^{-4}$  mol/dl) initiated insitu polymerization at varying concentrations (mol/dl) of acrylonitrile from  $9.0 \times 10^{-3}$  to  $21 \times 10^{-3}$  with PSF (50%, W/V, 10 ml) in NMP. Characterisation of PPBs was done through diversified spectral, thermal, microscopy and electrochemical methods. Electrochemical impedance spectra (EIS) and DC polarization in sodium chloride (0.25M) were used to evaluate the PSF for the corrosion protection of copper. Electrochemical data reveals the enhanced corrosion protection of PPBs over PSF for copper. Generally, coating of PPBs displays marginal delamination at rate of 0.53mm/yr in 29h. This work illustrates the corrosion protection of copper through coating of PPBs and in the same manner this can be executed for protection of other metals using polymer blends in saline media.

**Keywords:** Polysulphone, Polyacrylonitrile, polymer blends, Corrosion protection

**EXPLORING STRUCTURAL FEATURES AND MAGNETIC PROPERTIES IN  
COORDINATION POLYMERS**

**Mohammad Shahid\* and Mo. Ashafaq**

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**Abstract**

Coordination polymers where polynuclear clusters ( $M_n$ ) are building blocks constitutes an emerging class of coordination compounds. The fine-tuning of the structural motifs leads to interesting and varying magnetic properties. Owing to such properties, two rare  $\mu_6$ -oxo centered mixed-valent, azide or acetate-bridged coordination polymers (**1** and **2**) with retention of a  $\{Mn_{12}\}$  metallic core in both polymers are obtained using tripodal polyalcohol 1,1,1-tris (hydroxymethyl)ethane ( $H_3thme$ ) and 1,1,1-tris (hydroxymethyl)propane ( $H_3thmp$ ) ligands (Fig. 1). In **1**, a magnetic study ascertains the presence of antiferromagnetic interaction and it shows single molecule magnet-like behavior with an energy barrier of 75.5 K. However, **2** exhibited strong antiferromagnetic interaction in dc studies. The super-paramagnetic-like slow relaxation of its magnetization was not observed for **2** in out-of-phase ac magnetic susceptibility due to the absence of a large enough energy barrier. Magnetization versus an applied dc field exhibited a hysteresis loop at 2 K with a coercivity of 1069.10 Oe and remanent magnetization of 0.374  $\mu B$  in **1**, while **2** has no coercivity in the hysteresis loop even at the lowest temperature (2.0 K), and no saturation was observed up to 7.0 T field supporting antiferromagnetic interactions present in the polymer.

**DIVERSITY AND DISTRIBUTIONAL OF GRASSHOPPER OF SUBFAMILY  
SPATHOSTERNINAE (ACRIDIDAE: ORTHOPTERA) IN UTTAR PRADESH, INDIA**

**Md. Humayoon Akhtar<sup>1</sup> and Md. Rashid Nayeem<sup>2</sup>**

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**Abstract**

Grasshoppers are the members of family Acrididae and belongs to order Orthoptera which is of great economic importance, because they constitute an important group of pests and pose a constant threat to cereal crops, pulses, vegetables, orchards, grassland and forest plantations all over the world. Uttar Pradesh is the fifth largest state of India and majority of the population depends upon farming of wheat, rice, sugarcane and pulses as its main occupation. The climate varies from moderately temperate in the Himalayan region to tropical monsoon in the central plains and southern upland regions. Surveys were carried out between 2010 and 2012 at different habitats in Uttar Pradesh to explore the grasshopper species of the sub family spathosterninae. Only one genus and one species recorded from the area as per the available literature and specimens determined before. This is small and most common grasshopper in India commonly associated with grasses and occurs almost throughout the year. These cause considerable damage to the growing crops vegetables, garden plants and weeds.

**Keywords:** Diversity, Distribution, Grasshoppers, Spathosterninae, Uttar Pradesh.



**SYNTHESIS AND STUDY OF WEEDICIDAL ACTIVITY OF THIADIAZEPINES  
DERIVATIVES**

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**Abstract**

Several diazoles are known to exhibit herbicidal, fungicidal, pesticidal and plant growth regulator properties. Several seven membered heterocyclic compound have been reported to have good medicinal utility but any information related to its herbicidal or pesticidal or weedicidal character is not available so it was thought to combine a diazole nucleus with a seven or eight membered heterocyclic ring in hope to get a new compound of better weedicidal activity. For this purpose 7-aryl-2,4-dimethyl-1,3-diazolo [2,3-b ] [ 1,3,4 ]thiadiazepines were synthesized by refluxing a mixture of 4- aryl-3-amino-2-mercapto-1,3- diazole and 2,4- pentanedione and then tested for its weedicidal properties. Some of the synthesized compounds showed good weedicidal activity along with a very low phytotoxicity to the host plant.

**Key Words:** Weedicides, Diazoles, Thiadiazepines, Bioactive Heterocyclic Compounds

**BIOACTIVE COMPOUNDS FROM INDIAN MEDICINAL PLANTS USING  
NANOTECHNOLOGY**

**Ankur Johari and Mohsin Hasan Khan**

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**Abstract**

The novel properties of nanomaterials offer many new opportunities for the food industry. Different types of nanostructures can be incorporated into food in order to introduce new functionalities. These include; nanoliposomes, nanoemulsions, and nanoparticles. The sizes, shape, and internal structure of the particles vary considerably depending on the method and materials used to fabricate them. Bioactive compounds such as vitamins, antioxidants, and lipids can be protected using nanotechnology, even enhancing bioactivity and functionality. The design and application of nanoderived assemblies as tools for improved delivery and bioavailability of bioactive nutrients is promising. In this sense, success depends on scientific knowledge about degradation mechanisms of nutrients and major factors affecting them. Besides, it is necessary to review information in order to decide which delivery system fits with the desired application. In particular, nanotechnology has the potential to revolutionize dairy technology in the coming years.

**Keywords:** Bioactive compounds, nanotechnology nanoparticles phytochemicals; nanoparticles; controlled release; improved functionality; health; smart-formulation

**Sustainable Development: Need of Today for Tomorrow****Neha Gupta**

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**Abstract**

Sustainability is a term that can be applied to almost every facet of life on Earth from local to global scale and over various time periods. As the Earth's human population has increased natural ecosystem have declined and changes in the balance of natural cycles has had a negative impact on both humans and other living system. Its the duty of present generation to gift a clean environment and a balance natural cycle to future generation and for that it is essential to understand the term "Sustainable Development". The given paper aims to explain sustainable development and to know more about different dimensions of sustainable development.

**Key words:** Sustainability, Resources, Population, Biodiversity, Ecosystem.

**REVIEW ARTICLE ON COMPUTATION OF MICROMOLECULAR PROPERTIES BY  
EXTENDED HUCKEL THEORY****Vandna Tiwari and N.U. Siddiqui\***

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**Abstract**

Chemistry is really very helpful to us as its application are used worldwide for several purposes. We cannot really imagine a world without chemistry and its applications. However, we should now concentrate on green chemistry or sustainable chemistry, which refers to reducing or stopping the damage done to the environment around us. Hence green chemistry could include anything from reducing waste to even disposing of waste in the correct manner. Another way to save the environment through sustainable chemistry is to make use of computational process in the field of research, in the aspect of sustainability, our review is based on computational work by Extended Huckel theory.

**Keyword:** Extended Huckel Method, computation of micro molecular properties

**IRIDIUM(III) CATALYZED OXIDATIVE STUDIES OF 2-METHYL  
CYCLOHEXANOL AND 2-METHYL CYCLOHEPTANOL**

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**Abstract**

Various thermodynamic parameters were calculated by experimental findings. It is observed that the reaction followed direct proportionality with respect to  $[\text{Ir}^{\text{III}}]$ , while first order kinetics at low concentrations becoming to zero order at higher concentrations of both oxidant and organic substrates was observed. Retarding effect on rate with increasing concentrations of  $\text{H}^+$ ,  $\text{Ce}^{\text{III}}$  and  $\text{Cl}^-$  ions were observed.

**Keywords:** Cerium (IV), 2-methyl cyclohexanol, 2-methylcycloheptanol, oxidation, kinetics, oxidation

**A REVIEW TOWARDS SYNTHETIC STRATEGIES OF  $\alpha$ -CARBOLINES**

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**Abstract**

The first synthesis of biologically active natural product  $\alpha$ -carboline was reported before a century ago, since then chemists shown a steady interest to develop different synthetic strategies for this natural framework. The interesting moiety attributes a range of biological activities including cytotoxicity, anticancer and CNS activity. A careful literature survey reveals that various methods have been developed for the synthesis of this motif. Important and simple methodologies are summarized here in this review.

**Keywords:** Indole, Pyridine, Carbolines, Cytotoxicity, Anticancer

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ABSTRACT

**NATURAL PRODUCTS AS RESERVOIRS OF THERAPEUTIC AGENTS: AN OVERVIEW****Ram Pratap and Mohsin Hasan Khan\***Department of Chemistry, G. F. College, (Affiliated to MJP Rohilkhand University)  
Shahjahanpur, UP, India**Abstract**

Medicinal plants represent a reservoir of therapeutic agents and with the importance of multiple drug resistance strain against existing synthetic antibiotics. In recent years, secondary plant metabolites with previously unknown pharmacological activities have gained importance and often studied for its therapeutic efficacy. are historically been invaluable as a source of therapeutic agents. However, research into natural products in the pharmaceutical industry has declined, due to issues such as the lack of compatibility of traditional natural-product extract libraries with high throughput screening.

**Keywords:** Antibiotics Natural products, Pharmacological activities, Therapeutic

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ABSTRACT

**BIOACTIVE NATURAL PRODUCTS AS VERTIABLE SOURCE OF DRUGS AND MEDICINE: AN OVERVIEW****Azim Ansari and Mohsin Hasan Khan**Department of Chemistry, G. F. College, (Affiliated to MJP Rohilkhand University),  
Shahjahanpur, UP, India**Abstract**

Natural products have been playing an important role in drug discovery, in the last few years due its eco-friendly nature and low toxicity. Recently, there has been a renewed interest in natural product research due to the failure of alternative drug discovery methods to deliver many lead compounds in key therapeutic areas such as immunosuppressant, anti infectives, and metabolic diseases. In view to continue competition with other drug discovery methods, natural product research needs to regularly require to improve the speed of the screening, isolation, and structure elucidation processes, as well addressing the suitability of screens for natural product extracts and dealing with issues involved with large-scale compound supply.

**Key word:** Antimicrobial, Phytochemical, Natural resource

**ANTIMICROBIAL ACTIVITY OF GREENCHEMISTRY AND MEDICINAL PLANTS  
AGAINST URINARY TRACT INFECTION IN HUMANS**

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**ABSTRACT**

Medicinal plants are part of Green Chemistry and are affiliated with human society to combat diseases from the dawn of civilization. According to World Health Organization (WHO), about 80% of the world population rely chiefly on plant based traditional medicine specially for their primary health care needs and there has been a worldwide move towards the use of traditional medicines due to concerns over the more invasive, expensive and potentially toxic main stream practices. This review gives a bird's eye view on the updated information on urinary tract infections (UTIs), different categories of urologic herbs, historical use and modern scientific investigations on some important urologic herbs, clinical studies, some isolated chemical compounds and their possible side effects

**Keywords:** Medicinal plants, Urinary Tract Infections, Historical use, Scientific analysis, Clinical studies, Bioactive constituents, Possible side effects.

**IDENTIFICATION OF PHYTOPLASMA AFFECTING *ZINNIA ELEGANS* PLANT IN  
UTTAR PRADESH**

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**Abstract**

During survey of nurseries at Shahjahnapur district the incidence of phytoplasma disease with the symptoms of typical little leaf, yellowing were recorded on *Zinnia elegans* plants. Universal primer pair of P1/P7 amplified the 1.8 kb DNA fragment of phytoplasma 16S-23S rRNA from nucleic acid extracted from two symptomatic *Z. elegans* plants. Neither by direct (one round) nor by nested PCR, amplification was found from any non-symptomatic plants. BLASTn analysis of the present study isolate revealed more than 99% sequence identity with the 16SrRNA gene of isolates of '*Candidatus Phytoplasma asteris*' (16SrI) group and phylogenetic analysis also showed the close relationship with many isolates of '*Ca. P. asteris*' group.

**Keywords:** *Ca. P. asteris*, *Zinnia elegans*, India

## PHYTOPLASMA DISEASE ON WEEDS IN INDIA- A REVIEW

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**Abstract**

Phytoplasma cause diseases in several plant species and resulted in serious threat as a source of alternative natural host for the spread of phytoplasma pathogen to other economically important plants and thereby chances of causing severe losses. In earlier days very few phytoplasma diseases were identified in India merely on the basis of bright-field, fluorescence, electronmicroscope observations, tetracycline treatment and to a lesser extent by serological assays. Among these, microscopic methods do not attain pathogen identification, and all of them are not always sufficiently sensitive to detect phytoplasma infections in low-titer hosts. Today detection of phytoplasma based on molecular genetic methods including PCR assays are efficiently carried out in India and on that basis several plant species are reported to have phytoplasma infections. So far more than 37 plant species have been reported to be associated with phytoplasma infections from all over India. The “*Candidatus Phytoplasma asteris*”, “*Candidatus Phytoplasma aurantifolia*”, “*Candidatus Phytoplasma trifolii*” and “*Candidatus Phytoplasma cynodontis*” belong to 16SrI, 16SrII, 16SrVI and 16SrXIV group of phytoplasmas are the major groups associated with different species reported to be infected with phytoplasma throughout India. In this article, we have discussed overall progress on phytoplasma disease on plant species in India in terms of taxonomy, symptomatology, economic significance and characterization.

**Keywords:** Phytoplasma, 16Sr-RNA sequences, genetic diversity.



**ARSENIC CONTAMINATION IN GROUNDWATER IN INDIA: CHALLENGES FOR HEALTH****Mukesh Kumar**

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**Abstract**

In India, around 80% of the rural population and 50% of the urban population use ground water for domestic purposes. Water quality issues like arsenic, salinity, nitrate, iron, flouride and heavy metals in water due to geogenic and anthropogenic reasons have been reported from various parts of the country. High arsenic content in ground water affects the human, animal, soil and plant systems. Chronic exposure to arsenic causes arsenicosis and may include multi-organ pathologies. Many of the health effects of chronic toxicity are evident in India. Besides dermatological manifestations, noncommunicable diseases including cancer, adverse pregnancy outcomes, and decreased intelligence quotient among the children are reported to be increasing. Cancer due to long-term low-dose arsenic exposure through consumption of contaminated water is being increasingly reported from arsenic-exposed individuals. Stoppage of consumption of the arsenic-contaminated water is the mainstay of arsenicosis prevention and case management. At present, a higher proportion of the people are still consuming arsenic-contaminated water because of the lack of sustainable arsenic-safe water supply. In providing sustainable arsenicsafe water options, any option advocated should be cheap, easy to use, locally maintainable, and owned by the community. In addressing arsenic-related health issues, arsenic-exposed population needs to be brought under the coverage of the regular surveillance program for detection and subsequent management of non-communicable diseases.

**Keywords:** Arsenic, Arsenic contamination, Ground water, Arsenicosis.

**SYNTHESIS AND CHARACTERIZATION OF MODIFIED POLYSACCHARIDES FOR EFFECTIVE DYE REMOVAL AND ANTIBACTERIAL APPLICATIONS****Brijesh Kumar and Pramendra Kumar \***

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**Abstract**

A novel grafted based on the polymers, alginate and ghatti gum has been synthesized and used as an adsorbent for effectively methylene blue cationic dye removal and antibacterial activity. The grafted polymer was prepared by grafting between sodium alginate and ghatti gum with monomer AN and AM via microwave irradiation and reaction was quenched through appropriate inhibitor. The synthesized grafted polymer was characterized by Fourier Transform Infrared (FT-IR) spectroscopy, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM) and X-rays diffraction (XRD) analysis. The adsorption process varies with various parameters such as adsorption dose, concentration, pH, time, and temperature. The isotherm curve indicate, as the temperature decreases; the adsorption increases and almost constant after a certain temperature. The antibacterial study of maximum inhibitor growth of bacteria such as Staphylococcus aureus, Escherichia coli (E. coli) and (S. aureus) Pseudomonas aeruginosa (P. aeruginos) was evaluated at optimized samples.

**Keywords:** Polysaccharide, Grafting, Acrylonitrile, Acrylamide, Antibacterial activity

**EXPOSURE OF INDOOR RADON, THORON & THEIR PROGENY LEVELS IN  
DIFFERENT TYPES OF HOUSES OF DISTRICT SHAHJAHANPUR, UTTAR  
PRADESH.**

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<sup>2</sup>Department of physics, M S (PG) College, Chakrata Road, Saharanpur

**Abstract**

Inhalation of radon ( $^{222}\text{Rn}$ ), Thoron ( $^{220}\text{Rn}$ ) and their decay products/progeny contribute to more than 50% of the total annual effective dose due to natural sources of radioactivity. Since  $^{222}\text{Rn}$  and  $^{220}\text{Rn}$  are ubiquitous in nature, and they keep on accumulating in the indoors, it is a source of inhalation dose to general population. Thus it is important to measure their respective concentrations in the room. However to assess the inhalation lung dose, it is important to carry out a simultaneous multiparametric analysis, which includes the measurement of equilibrium factor, measurement of Equilibrium Equivalent Concentration (EEC) of radon and thoron, estimation of unattached fraction etc. Equilibrium factor between radon/ thoron and their progenies is very important for dose assessment from inhalation of radon and its progeny. Since the equilibrium factor depends largely on environmental conditions (ventilation rates, humidity, hours etc). These conditions are expected to vary from house to house as well as from time to time. So, in the present work the measurement of radon, thoron, EERC, EETC & equilibrium factor for radon and thoron has been carried in 35 houses in the district Shahjahanpur.

The concentration of radon in study area varied from 21 Bq/m<sup>3</sup> to 92 Bq/m<sup>3</sup> with an average of 54 Bq/m<sup>3</sup>. Value of thoron concentration in district Shahjahanpur varied from 11 Bq/m<sup>3</sup> to 31 Bq/m<sup>3</sup> with an average of 19 Bq/m<sup>3</sup>. The concentration of radon progeny (EERC) varied from 8 Bq/m<sup>3</sup> to 25 Bq/m<sup>3</sup> with an average of 15 Bq/m<sup>3</sup>. Concentration of thoron progeny (EETC) varied from 0.13 Bq/m<sup>3</sup> to 2.02 Bq/m<sup>3</sup> with an average of 0.90 Bq/m<sup>3</sup>. The value of equilibrium factor for radon varied from 0.13 to 0.69 with an average of 0.34. The value of equilibrium factor for thoron varied from 0.01 to 0.12 with an average of 0.05.

**Keywords:** Pin hole dosimeter, DTPS, DRPS, Indoor radon & thoron concentration.

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**ABSTRACT**

**STUDIES ON NICKEL CONTAINING CADMIUM SELENIDE PHOTOACTIVE FILMS**

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**Abstract**

Synthesis of nickel containing cadmium selenide semiconducting films has been carried out through electrochemical codeposition technique and compared with the photoelectrochemical characteristics of cadmium selenide synthesized and tested under similar experimental conditions. The inclusion of nickel affects significantly the characteristics of zinc selenide. Photoaction spectral studies have been carried out for the measurement of the band gap of cadmium selenide and nickel containing cadmium selenide films. Capacitance measurements and current–voltage behavior in dark and under illumination have also been used for their characterization. The nickel containing zinc cadmium films exhibit relatively improved quality in terms of enhanced photoresponse but inclusion of higher concentration of nickel cause decrease in the stability of deposited films. However addition of cetyl pyridinium chloride in small concentration stabilizes these deposited films and decreases their corrosion rate.

**Key words:** Electrochemical codeposition, photoresponse, photoaction spectral studies, capacitance, band gap, corrosion rate.

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ABSTRACT

**CORROSION STUDIES ON Hg AND Ga CONTAINING CADMIUM SELENIDE  
PHOTOELECTROACTIVE ALLOY FILMS**

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273001 (UP), India

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**Abstract**

(CdHg)Se and (CdGa)Se alloy of variable compositions have been prepared in the form of films on titanium substrate using electrochemical codeposition technique. These films were subjected to thermal treatment under controlled condition. Electrochemical impedance measurements have been employed to estimate polarization resistance of the alloy films for the estimation of their corrosion rate.

**Key words:** Electrochemical codeposition, thermal treatment, polarization resistance, corrosion rate.

SES37

ABSTRACT

**SYSTEMATIC STUDY OF ANTIMICROBIAL PROPERTIES OF SOME NATURAL  
PRODUCTS PRESENT IN DIFFERENT PLANTS**

**Madhu Gautam<sup>1</sup> and Roopali Tondon<sup>2</sup>**

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**Abstract**

Plants spices and herbs have been long used for thousands of centuries by ancient cultures to enhance the flavor and aroma of foods. Ancient societies recognized the value of using spices and herbs in preserving foods and for their medicinal values. Scientific experiments since 19<sup>th</sup> century, have documented the antimicrobial properties of some spices, herbs and phytochemicals present in them. This overview pointed out many of the effects of different plants and herbs on microorganisms.

**Keywords:** antimicrobial effect, spices, herbs, microorganisms.

**BIOMASS BASED COMPOSITES FROM DIFFERENT SOURCES****Mohd Amil Usmani**

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**Abstract**

The use of biomass as an energy source has considerably even increasing in the current scenario. However, biomass availability is crucial for the implementation of any strategy that focuses on bioresources for fuel, chemicals and biomaterials. Mostly, lignocellulosic biomass such as wasted bioresources has been employed extensively towards its valorisation. Besides consideration of wasted bioresources, it would be essential to intensify the overall agricultural productivity and, at the same time, identify the potential of relatively unexplored bioresources. Due to the diverse natures of biomass materials, their properties widely range and exhibit different behaviours. This chapter shows the properties of biomass in its wide diversity, i.e., both physical, chemical, mechanical properties and its characterization.

**Keyword:** Biomass, Lignocellulose, Natural fibres.

**FISH AND FISHERIES OF RIVER GANGA, INDIA: A REVIEW****Shahista Khan, Jamil Ahmad, Arib Anjum Rehman, Mohammad Shoeb**

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**Abstract**

Ganga River known as Ganga Maata or Mother Ganges is respected as a goddess whose purity cleanses the sins of the faithful and aids the dead on their path toward heaven. The river Ganga is the largest river in India and the fifth longest in the world. Ganga river in northern India is of great importance because its water is used for human and cattle consumption, power generation, fish production and irrigation and for pilgrimage. Flora and fauna of river Ganga is threatened by anthropogenic activities. The river has been under constant threat of pollution by sewage and industrial wastes, disposal of dead bodies, deforestation, excessive use of fertilizers and pesticides. The impact involves gross changes in water quality viz reduction in dissolved oxygen and reduction in light penetration that tends to loss in self purification capability of river water. Any change in aquatic environment will alter the structure and composition of biotic community.

**Keywords:** Fish, Freshwater, Ganga river, India, pollution.

**MICROBIAL CONTROL OF INSECT PEST****Mohd. Aakib<sup>1</sup>, Arshad Ali<sup>1</sup>, Rajesh Kumar<sup>1</sup>, Mahesh Chandra<sup>2</sup>, Shailendra Pratap Singh<sup>3</sup>**<sup>1</sup>Department of Zoology, Gandhi Faiz-e-Aam College, Shahjahanpur – 242001, U.P.<sup>2</sup>Department of Zoology, P.C. Bagla (P.G.) College, Hathras – 204101, U.P.<sup>3</sup>P.P.N. (P.G.) College, Kanpur.-208001, U.P.

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**Abstract**

Insect pests are always become a problem to man since they started cultivation of the crops. They cause economic losses to our commodities in different ways. But their control becomes a major

problem, though it developed resistance against many insecticides. However, a variety of problems are associated with the traditional use of non selective insecticides which include environmental issues, negative impact on nature enemies, food safety and hazards to human health. Therefore, use of other alternatives like microbials being more conventional in the present scenario. Moreover, microbial control of insects can concern with the use of insect-specific pathogens viz., virus, bacteria, protozoa, fungi and nematodes, which are capable for killing the insect pests. Generally they are attacking to the targets and reduce the pest population below economics without disturbing the ecosystem and biodiversity. Use of microbial pesticides has number of advantages over chemical pesticides and also helps to maintain equilibrium of our natural ecosystem. The demand of microbial pesticides increased drastically since last two decades in the global market, which can become possible only due to awareness among the farmers.

**Keywords:** Bacteria, fungus, nematodes, protozoa, pesticides, virus.



SES 41

ABSTRACT

## ATMOSPHERIC EFFECT OF BROMINE AND PARAMETRIC CALCULATION OF Br II

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### Abstract

Bromine is a halogen and nonmetallic element. It is very harmful to the atmosphere. The second spectrum of bromine (Br II) is Se I-like ion with ground configuration  $4s^2 4p^4$ . This is a 4-electron system and having a complex structure. Theoretical structure of Br II was predicted using Cowan's Computer code. The excited configurations  $4s^2 4p^3(5s+6s+7s+8s)+4s^2 4p^3(4d+5d+6d)$  in the odd parity matrix and  $4s^2 4p^3(5p+6p+7p+4f)$  in the even parity system were taken for parametric calculation. Relativistic Hartree-Fock (HFR) and least squares fitted (LSF) parametric calculations were used to the experimental energy levels taken from ASD NIST(USA) link.

**Keywords:** Energy parameters, Atomic spectra, Relativistic Hartree-Fock, Energy levels, Atmospheric effect, ab initio.

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ABSTRACT

## TRENDS OF PM<sub>2.5</sub> AND PM<sub>10</sub> IN AMBIENT AIR OF LUCKNOW CITY, INDIA

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<sup>2</sup>Department of Geography, Gandhi Faiz-E-Aam College, Shahjahanpur

### Abstract

From the industrial to the rural and urban areas Particulate matters PM<sub>2.5</sub> and PM<sub>10</sub> are the main sources of Air pollution. Particulate matter (PM) is a mixture of extremely solid particles and liquid droplets. Some examples include automobile exhaust, soot, and fugitive dust emission. There is a high fluctuation rate in PM<sub>2.5</sub>. As per the report of 2009, the annual concentration of PM<sub>2.5</sub> was 89.4  $\mu\text{g}/\text{m}^3$  and 2018 its 202  $\mu\text{g}/\text{m}^3$ . As per the record of January 2019 in the Vikas Khand station of Lucknow PM<sub>10</sub> recorded alarmingly high levels 369  $\mu\text{g}/\text{m}^3$ .

**Keywords:** Air pollution, PM<sub>2.5</sub> and PM<sub>10</sub>, Lucknow.

**POLLUTION AND ITS EFFECT ON LIFE**

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**Abstract**

Pollution is a wide-reaching problem and it is likely to influence the health of human populations is great. This paper provides the insight view about the affects of pollution in the perspective of environment, air, water and land/ soil waste pollution on human by diseases and problems, animals and trees/ plants. Study finds that these kinds of pollutions are not only seriously affecting the human by diseases and problems but also the animals and trees/ plants. According to author, still time left in the hands of global institutions, governments and local bodies to use the advance resources to balance the environment for living and initiates the breathed intellectuals to live friendly with environment. As effective reply to contamination is largely base on human appraisal of the problem from every age group and voluntary participation.

**Keywords:** Environment Pollution; Air Pollution; Water Pollution; Soil Pollution; Land Pollution.

**DEPENDENCE OF PC4 OCCURRENCE ON KP VALUES AT LOW LATITUDES IN INDIA**

**\*A. K. Singh<sup>1</sup> and M. T. Khan<sup>2</sup>**

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**Abstract**

A recent study has been undertaken for Pc4 geomagnetic pulsations ( in 6.7 – 22.2 mHz frequency range) at three very low latitude stations, viz. Pondicherry (PON) (geomagnetic latitude 2.5° N, geomagnetic longitude 151.97° E ), Nagpur (NAG) (geomagnetic latitude 11.72° N, geomagnetic longitude 151.93° E ), Hanley (HAN) (geomagnetic latitude 23.38° N, geomagnetic longitude 151.89° E ) in India employing three axis fluxgate magnetometers, established and operated by the Indian Institute of Geomagnetism (IIG), Navi Mumbai. Digital Dynamic Spectra (DDS) for the north-south (X), east-west (Y) and vertical (Z) components of the recorded data were constructed for each day for one year (January 1 to December 31, 2005). The X- and Y-components of these DDS were investigated for carrying out statistical study of the dependence of diurnal and seasonal variations of occurrence of Pc4 events on Kp.

The monthly variation of Pc4 occurrence has a Kp dependence range of 0 to 9-. However the yearly Pc4 occurrence was found to be evenly distributed with magnetic activity over the Kp = 2- to 4 range at all the three stations with the peak occurrence recorded at Kp = 3-. The magnitudes of durations of Pc4 occurrence decreased in the station order PON, HAN and NAG respectively. The prominent peaks in the seasonal Pc4 occurrence were observed at Kp = 3-, 3 for all the seasons. However additional peaks were observed at Kp = 1-, 1 and 1+ for the autumn season. It is also worth noting that Pc4 in winter was observed during intense magnetic activity when  $5+ < Kp < 8+$ .

**Keywords:** Pc4 geomagnetic Pulsations, MHD waves and instabilities, Solar wind – Magnetospheric interactions.

**STATISTICAL CHARACTERISTICS OF Pc4 MAGNETIC PULSATION WITH Kp INDICES AND ITS VARIATION ON SOLAR WIND VELOCITY**

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**Abstract**

Magnetic Pulsations recorded on the ground on the Earth are produced by processes in the magnetosphere and solar wind. These processes produce a wide variety of ULF hydromagnetic wave types that are classified on the ground as either Pi or Pc pulsations (irregular or continuous). Different regions of the magnetosphere originate different frequencies of waves. Digital Dynamic Spectra (DDS) for the north-south (X), east-west (Y) and vertical (Z) components of the recorded data were constructed for each day for one year (January 1 to December 31, 2005). Pc4 geomagnetic pulsations are quasi-sinusoidal variations in the earth's magnetic field in the period range 45-150 seconds. The magnitude of these pulsations ranges from fraction of a nano Tesla (nT) to several nT. The present study is undertaken for describing the Statistical Characteristics of Pc4 Magnetic Pulsation with Kp indices at low latitude in India and its Variation on Solar wind Velocity (VSW). The monthly variation of Pc4 occurrence has a Kp dependence range of 0 to 9-. The magnitudes of durations of Pc4 occurrence decreased in the station order PON, HAN and NAG respectively. It is also worth noting that Pc4 in winter was observed during intense magnetic activity when  $5+ < Kp < 8+$ . Analysis of the data for the whole year 2005 provided similar patterns of Pc4 occurrence for VSW at all the three stations. Although Pc4 occurrence was reported for VSW ranging from 250 to 1000 Km/s, yet the major Pc4 events occurred for a VSW range of 300-700 Km/sec. The results suggest that the solar wind controls Pc4 occurrence through a mechanism in which Pc4 wave energy is convected through the magnetosheath and coupled to the standing oscillations of the magnetospheric field lines.

**Key Word:** Pc4 Magnetic pulsations, MHD waves and instabilities, Solar wind-control of Pc4 pulsation

***TRICHOGRAMMA*: BIOLOGICAL CONTROL AGENT FOR SUSTAINABLE  
AGRICULTURE**

**Arshad Ali**

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**Abstract**

Most of the farmers are relying on toxic chemicals for the control of insect pests to achieve the successful cultivation of various crops. This process is disturbing the natural equilibrium of the ecosystem. Therefore, it has become imperative to follow an alternative ecologically viable and economically feasible technology to suppress insect pest population. Several parasitoids and predators of insect pests have been successfully used in pest management programme. Among them, *Trichogramma* spp are one of the most potentially important biocontrol agents. *Trichogramma* spp parasitize over 200 insect species belonging to 70 families and 8 orders in diverse habitats from aquatic to arboreal. In India, about 18 *Trichogramma* spp have been recorded, of which *T. chilonis*, *T. japonicum* and *T. achaeae* are widely distributed and are key mortality factor at egg stage of many lepidopterous pests. Moreover, present study extensively discusses the mass multiplication techniques of *Trichogramma* spp in the laboratory and releases them in the field of different crops. In this way, wide use of *Trichogramma* spp develops a broad ecological approach for suppression of injurious insect pests and also helps to conserve the normal equilibrium in its right position by utilizing biotic factors of the ecosystem. It may only be possible through frequent mass releases of laboratory reared *Trichogramma* in a large crop areas.

SES47

ABSTRACT

**HYDRO-CHEMICAL ANALYSIS OF KHANNAUT RIVER AT DISTRICT  
SHAHJAHANPUR**

**Daniyal Khan<sup>1</sup>, AribAnjum Rehman<sup>1</sup>, Mohd. Shoeb<sup>1</sup>, Shahista Khan<sup>1</sup> and Rajeev Sharma<sup>2</sup>**

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**Abstract**

The river is a natural source of water, which become toxic due to discharge of different industrial, domestic and agricultural waste. The present study is aim to chemical analysis of water of Khannaut river (Tributary of Ramganga in Shahjahanpur) which may directly or indirectly influenced the flora and fauna of the water body. Some parameters such as pH, Dissolved Oxygen(DO) and Biological Oxygen Demand (BOD)were studied and find that Hanumat Dham (27°88'N 79°91'E) is much polluted due to increment of pH, BOD and decrement of DO as compare to Puwanyan (28°04'N80°06'E).

SES 48

ABSTRACT

**PHYTOCHEMICALS AS ANTIMICROBIAL AGENTS**

**Ashish Mishra and Mohsin Hasan Khan**

Department of Chemistry

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**Abstract**

Most of the microbial infections are transmitted via contaminated food and water, hospital acquired infection, naturally acquired infection and intentional infection. Phytochemicals as secondary metabolite provide defense against many microorganism. This chapter discuss phytochemical analysis and antimicrobial activity of some medicinal plants like *Foeniculumvulgare*, *Curcuma longa*, *Syzygumaromatic*, *Coriandrumativum* and *Piper nigrum*

**Key words:** Agar Well Diffusion Assay, *Foeniculumvulgare*, Phytochemicals *Piper nigrum*.

**SES 49****ABSTRACT****PHYTOCHEMICALS: AS PHARMACEUTICAL****Ved Ram Sharma and Mohsin Hasan Khan**

Department of Chemistry, Gandhi Faiz-e-Aam College, Shahjahanpur, U.P. 242001

**Abstract**

India has rich culture of medicinal plants. Medicinal plants contain many phytochemicals as secondary metabolites which have antioxidant activities, antimicrobial effect, detoxification, modulation and anticancer activity. These are categorised as alkaloids, flavonoids, glycosides, tannins, saponins, phenolics and terpenoids.

**Keywords:** Alkaloids, Antibacterial activity, Phytochemicals and Saponins.

**SES 50****ABSTRACT****ENVIRONMENTAL AWARENESS THROUGH ECOCRITICISM IN INDIAN  
ENGLISH LITERATURE****Reefaqt Husain**

Department of English, G. F. College, Shahjahanpur-242001, U.P.

**Abstract**

One of the pressing problems of the twenty-first century is the environmental degradation that has awakened the environmentalists to think over this problem and to search for different ways of maintaining the liveable environment. Even the literary artists also could not remain untouched with this awesome phenomenon. Eco-criticism in literature is also an effort in this direction. In this paper an effort has made to show how ecocritical approach to some literary works in Indian English literature has brought on surface that the writers, consciously or unconsciously were concerned with the environmental disturbance due to the irresponsible actions of man. That is why they show the benign influence of nature on their characters and their desire to return to the unspoiled nature in order to restore lost harmony and simplicity. The writers and critics are making collective efforts to protect environment by creating eco-consciousness among the reading section and the people in general.

**SIGNIFICANCE OF MOLECULAR INTERACTION STUDIES ON MIXED SOLVENT  
OF CHEMICAL COMPOUNDS**

**Shalini Gupta\*<sup>1</sup>, Vikas Jain<sup>2</sup>, N. U. Siddiqui<sup>1</sup>, Ruchi Agarwal<sup>2</sup>, Avinash Agarwal<sup>3</sup> and  
Munish Kumar<sup>3,4</sup>**

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**Abstract**

Intermolecular interactions play an important role in multicomponent mixtures of chemical and nano compounds. They influence the arrangement, orientation and conformations of the molecules in solutions. The dielectric and ultrasonic studies have provided enormous data to understand the molecular interactions and structural behaviour of the molecules. Ultrasonic waves have been used to investigate the nature of molecular interaction and chemical behaviour of pure, binary and ternary liquid mixtures. The mixed solvent has utmost practical importance in most chemical and industrial processes. The mixed solvent systems are frequently used and provide a wide range of mixtures in varying proportions so as to permit continuous adjustment of desired properties of the medium. The measurement of ultrasonic velocity together with some other parameters provide the information, about the interaction between ions, structure behaviour, dipoles, hydrogen bonding and dispersive forces. The measurement of ultrasonic velocity is also helpful in the study of multicomponent nano mixtures at various concentrations; measured by using nano fluid interferometer. The study of acoustic properties provides the information about the intermolecular interaction and structure behaviour not only in chemical compounds but also in nano compounds. In the present work, ultrasonic velocities have been measured for binary mixture of chemical compounds. Experimentally it is found that ultrasonic velocity strongly depends upon concentration of binary mixture. The detail of the work will be presented at time of conference.



**ALGAE: A PROSPECTIVE FOR BIO-FUEL****Ghaliya Shamim Ansari**

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**Abstract**

Biofuels are the most awaited products of scientific research. The fossil fuels are being exhausted, and pollution is increasing globally. Algal biofuels are wonderful tiny factories that yield a variety of substances that have the property to act as sources of ecofriendly fuels. The distinct features that microalgae possess include high biomass yield, abundant oil content, no requirement for land and easy cultivation in wastewaters coupled with carbon dioxide mitigation. The algal biofuels range from biodiesel, lipids, ethanol and hydrogen. Biofuels are the need of today, and researchers are exploring the options for biofuel production.

**Keywords:** Aalgae, Biofuels, Renewable energy, Algal biomass.

**TOOLS OF OPERATIONAL RESEARCH IN AGRICULTURE****Sohail A. Naqvi<sup>1</sup> and Mujeeb Uddin<sup>2\*</sup>**<sup>1</sup>Department of Botany, G. F. College, Shahjahanpur (Affiliated to M. J. P. Rohilkhand University, Bareilly) U.P.<sup>2</sup>Department of Mathematics, G. F. College, Shahjahanpur (Affiliated to M. J. P. Rohilkhand University, Bareilly, U.P, India)

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**Abstract**

The Operational Research consist of a group of primary quantitative techniques based in Mathematical programming and linear programming is the most widely used technique from this group. Linear programming is used for planning in the field of agriculture and agribusiness for a long time. The experiment is so designed that in the first part the theme is elaborated theoretically while further, through practical example of application of crop production and livestock production. There are many practical problems in the field of agribusiness which could be solved by linear problem. The material presents practical examples for linear programming for crop and livestock production.

**ERI CULTURE AND EMPLOYMENT OPPORTUNITIES IN UTTAR PRADESH****Rajesh Kumar\*, Arshad Ali and Jamil Ahmad**

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**Abstract**

Sericulture was introduced in Uttar Pradesh as back as 1847 in Lucknow by captain Hollings. Uttar Pradesh is highly populated state of India. It has diversified climate, vegetations, topographies and soil types. It is traditionally agriculture based state with maximum number of small / marginal agricultural farmers to the extent of 80 % with 0.89 hectare of average land. Pressure of population on land based activities is increasing and land holding capacity is decreasing every day. Eri culture is agro-based small scale industry, which include rearing of silkworm for production of silk. It is considered as an important point to generate income as well as employment to small and marginal's farmers. Eri culture has vast potential to generate employment for skilled and non-skilled persons. These opportunities applied for the benefits of farmers and also for socio-economic upliftment of societies. The main purpose of ericulture is to exploit the available castor plant for rearing of silkworm and also to develop employment opportunities for local peoples. So there is an urgent need to develop awareness among the farmers about the rearing of eri silkworm. Moreover, it may also develop poverty alleviation in the rural of Uttar Pradesh.

**AN OVERVIEW OF STRUCTURAL PROPERTIES OF VEGETABLE OILS: A SUSTAINABLE ALTERNATE OF PETROLEUM-BASED POLYMERIC RESINS**

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**ABSTRACT**

Sustainable development, which became a key idea during the 20<sup>th</sup> century, may be regarded as the progressive and balanced achievement of sustained economic development, and improved social equity and environmental quality. In recent years vegetable oils have attracted much attraction as a raw material for the preparation of resins and polymeric materials to replace the traditional petrochemical based polymeric resins. The vegetable oil based polymers have many advantages over the polymers obtained from petroleum-based monomers. They are known as biodegradable in nature and are also eco-friendly than petroleum-based polymers. In this paper an overview on the unique properties of vegetable oils is discussed which made them the alternative raw material of petroleum based polymeric coating materials.

**Key words:** sustainable development, vegetable oil-based polymers, coating materials.

**BIODIVERSITY OF INSECTS IN THE VICINITY OF CANTONMENT  
SHAHJAHANPUR, UTTAR PRADESH**

**Arshad Ali\*, Jamil Ahmad, Rajesh Kumar, Mohd. Akib, Khushboo Ali, Arshi, Mansi  
Prajapati, Sheeloo Pal, Richa Sharma and Saumya Awasthi**  
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**Abstract**

Biodiversity is the variation among living organisms from different sources including terrestrial, marine and desert ecosystems, and the ecological complexes of which they are a part. Present study deal the study of insect biodiversity, which present in crop as well as forest area of cantonment and its surroundings at district Shahjahanpur. To achieve the observations, fauna of insects has been collected from different part of cantonment area. The result showed that the insects collected were identified as *Pieris brassicae* (Lepidoptera: Pieridae), *Papilio demoleus* (Lepidoptera: Papilionidae), *Danaus chrysippus* (Lepidoptera: Nymphalidae), *Melanitis ismene* (Lepidoptera: Nymphalidae), *Sphinx* moth (Lepidoptera: Sphingidae), Amatid moth (Lepidoptera: Amatidae), *Acrida exaltata* (Orthoptera: Acrididae), *Choroedocus illustris* (Orthoptera: Acrididae), katydids (Orthoptera: Tettigoniidae), *Gryllotalpa gryllotalpa* (Orthoptera: Gryllotalpidae), *Mylabris pustulata* (Coleoptera: Meloidae), *Holotrichia serrata* (Coleoptera: Scarabaeidae), *Cicindela sexpunctata* (Coleoptera: Carabidae), *Zygogramma bicolorata* (Coleoptera: Chrysomelidae), *Coccinella septempunctata* (Coleoptera: Coccinellidae), *Polistes hebraeus* (Hymenoptera: Vespidae), *Apis dorsata* (Hymenoptera: Apidae), *Sceliphron caementarium* (Hymenoptera: Sphecidae), *Pentatoma hilaris* (Hemiptera: Pentatomidae), *Dysdercus koenigii* (Hemiptera: Pyrrhocoridae), dragonflies (Odonata: Aeshnidae), damselflies (Odonata: Lestidae), *Musca domestica* (Diptera: Muscidae), *Nephrotoma* spp (Diptera: Tipulidae), *Mantis religiosa* (Mentodea: Mentidae) and *Periplaneta americana* (Blattodea: Blattidae). The insects belong to order Lepidoptera showing highest biodiversity in cantonment area of Shahjahanpur.

**Keywords:** Beetle, butterfly, dragonfly, fauna, flies, insects, moth .

**SURVEY AND COLLECTION OF INSECT PEST IN CANTONMENT  
SHAHJAHANPUR, UTTAR PRADESH**

**Arshad Ali, Arib Anjum Rehman, Daniyal Khan, Surabhi Gupta, Afreen, Iffat Jamal,  
Jyoti Saxena, Anamika Singh and Farha Khan**  
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**Abstract**

An extensive survey has been made to collect the insect pest in the surrounding of cantonment area of Shahjahanpur, Uttar Pradesh. To achieve the observations a total of 365 insects have been collected by the students of M.Sc. Zoology. Findings revealed that the insects collected from above said area belong to seven different orders *i.e.*, Lepidoptera, Orthoptera, Coleoptera, Hymenoptera, Hemiptera, Odonata and Diptera. Among them maximum insect of order lepidoptera was collected with a total of 161 moths and butterflies, followed by hymenoptera with 58 wasps and bees, coleoptera with 43 beetles, orthoptera with 40 grasshoppers and crickets, hemiptera with 37 hoppers, odonata with 14 dragon flies and diptera with 4 flies. In addition, 4 specimens of mentis belonging to order mentodea and also concern to biological control were collected from this area. The main insect pest collected were: cabbage butterfly, citrus butterfly, amatid moth, hawk moth, sugarcane white grub, sugarcane grasshopper, katydids, mole cricket, honey bees and yellow wasps, stink bug, dragonfly, daddy long leg fly etc. The insects collected were the pest of different crops grown in the surroundings of cantonment *viz.*, cabbage, cauliflower, citrus, sugarcane and rapeseed-mustard.

**Keywords:** Beetle, bug, cabbage, citrus, moth, fly.

**RENEWABLE RESOURCES AND ITS IMPACT ON SUSTAINABLE DEVELOPMENT****A. Hasnat**

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Shahjahanpur, U.P. India.

**Abstract**

Much attention has been paid to achieve the ultimate goal of sustainability. Vigorous efforts have been made through interdisciplinary approaches in this regard. Numerous agricultural based starting materials have been reported for development of eco-friendly materials of viable applications design new route to excessive utilization of these materials. Among different renewable resources vegetable oils are largely spotted by the academicians due to its unique characteristics eco-friendly characteristics. In present overview efforts have been made to discuss the different characteristics of the vegetable oil.

**Key words:** Vegetable oil, Renewable resource, Sustainable development.

**ECO-FRIENDLY ADVANTAGEOUS MATERIALS DERIVED FROM VEGETABLE  
OILS**

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Shahjahanpur, U P 242001, U.P. India

<sup>b</sup>Department of Botany, G.F. College (Affiliated to M.J.P.Rohilkhand University), Shahjahanpur,  
U.P. India.

**Abstract**

Polymers are comprehensively used in developing small house hold articles to outstanding machineries, in addition to their outstanding utility in biomedical, bioengineering, textile industries. The majority of polymers are derived from petrochemicals a non-renewable resource and is going to deplete day by day. Furthermore use of petrochemicals affects the environment appreciably with the increase in discharge of greenhouse gases. Now a day investigations are therefore, spotted on developing polymers from plants and agriculture origin. Among various renewable resources vegetable oils, a triglyceride rooted with different unsaturated and saturated fatty acids play very vital role in the synthesis of polymers of springy utility. In the present communication efforts has been made to explain some useful polymers obtained from vegetable oils.

**Keywords:** Vegetable oil, renewable resource, bio-based polymers

## SES 60

## ABSTRACT

**CLIMATE CHANGE AND GLOBAL WARMING AND ITS CONSEQUENCES****Azahar Sajjad**

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**Abstract**

There are numerous natural and human activities collectively responsible for climate changes. Climate change leads to several adverse effects on all living being on the earth. It is required to aware the peoples about this ethically. There is no use of one group of countries reducing their emission if another group increases them. The problem can be solved only if all the countries join together and control the GHG emission to a safe limit. The challenges before us are therefore to protect our environment and ensure the well-being for future. In present section efforts have been made to summarize the several causes and consequences as well as some useful strategies.

**Key Words:** Climate changes, Greenhouse gasses, Environment

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## ABSTRACT

**PRACTICABLE MATERIALS DERIVED FROM RENEWABLE RESOURCE: A PERSPECTIVE****A. Salam<sup>a</sup> and A. Hasnat<sup>\*b</sup>**<sup>a</sup>Department of Mathematics, G.F. College (Affiliated to MJP Rohilkhand University), Shahjahanpur, U.P.<sup>b</sup>Department of Chemistry, G.F. College (Affiliated to MJP Rohilkhand University), Shahjahanpur, U.P.**Abstract**

Several renewable resources are spotted by the different industries for sustainable development. India is an agriculture based country numerous plants and herbs are available, which provides various type of natural starting materials. Among them some common examples are starch, cellulose, protein, poly (lactic acid), cashewnut shell liquid, lignin, triglyceride oils obtained from different seeds. These materials themselves provide opportunities to use for many useful materials. Furthermore easy derivatization makes enormous utility.

**Keywords:** Sustainable resource, Renewable resource, Carbohydrate.



**IMPACT OF POLLUTED WATER ON ENVIRONMENT****Ekata Singh**Department of Chemistry, Dr. R.M.L.Govt. Degree College Aonla, Bareilly  
E-mail: [ektasinghchem@gmail.com](mailto:ektasinghchem@gmail.com)**Abstract**

Water is the main constituent of a body. As about 70% of our body weight is made of water. Water is the main constituent of cells, tissues and organs and is vital for life. Due to growing population, lack of resources for water, infrastructure maintenance and investment, climate change, urbanization have created a major threat to water supplies as well as water quality. Industrialization, in any society, is a major initiator of development and urbanization. Although the merits of industrialization are innumerable, it has been identified as a major threat to the environment as it releases various toxic chemicals, gases, solid wastes as well as microbes of various kinds into our environment. Water pollution can be defined in many ways. Water pollution is the contamination of water bodies, usually as a result of human activities, water bodies include for example lakes, rivers, oceans, aquifers and groundwater. Water pollution results when contaminants are introduced into the natural environment. Usually it means one or more substances have built up in water to such an extent that they cause problems for plants animals and human beings. Ocean, lakes and other water bodies can naturally clean up a certain amount of pollution by dispersing it harmlessly. For example, releasing inadequately treated wastewater into natural water bodies can lead to degradation of aquatic ecosystems. In turn, this can lead to public health problems for people living downstream. They may use the same polluted river water for drinking or bathing or irrigation. Water pollution is the leading worldwide cause of death and disease, e.g. due to water-borne diseases.

**EFFECT OF ADDITIVES ON CONVENTIONAL SURFACTANT AND ITS EFFECT  
ON ENVIRONMENT**

**Anshul Gupta, Dinesh Singh, Runjhum Agrawal, Saumya Gupta, Afroz Hasan**  
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**Abstract**

Surfactants are the surface active agents having at least two parts, one which is soluble in a specific fluid (the lyophilic part) and one which is insoluble (the lyophobic part). When the fluid is water these parts are known as the hydrophilic and hydrophobic, respectively. Their surface properties can be studied very well in presence of additives like alcohols and amines. They form mixed micelle in the presence of additives. Various concentrations of alcohols and amines can be used to find the critical micelle concentration. The narrow concentration at which micelle formation takes place is called critical micelle concentration. It is not surprising that today they are widely used as effective emulsifiers, bactericidal agents, dispersants, antifoaming agents, detergents etc. other thermodynamic parameters can also be calculated with the help of critical micelle concentration. Surfactants in presence of additives have very low hazardous effect on environment. They can also be used in cosmetics at very low price. They form synergism in the presence of additives. So the synergism parameters can also be calculated by using Rubing and Rosen model.

**Keywords:** Alcohols, Amines, surfactant, mixed micelle, synergism.

## **SURFACE PROPERTIES OF GEMINI SURFACTANTS IN PRESENCE OF ADDITIVES AND ITS IMPACT ON ENVIRONMENT**

**Jane Alam, Aysha Khan, Sidra Jameel, Sandeep Kumar Gupta, Vijay Kumar**  
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### **Abstract**

Gemini surfactants are the interesting class of surfactants which possess superior properties in comparison with conventional surfactants. These are the surfactants having two hydrophilic and two hydrophobic parts. They show better wetting properties in comparison with conventional surfactants. Conventional surfactants are those surfactants having one hydrophobic and one hydrophilic part. The surface properties of Gemini surfactants can be studied in the presence of various additives. The Gemini surfactants can also be used in various industrial applications. The surface properties of Gemini surfactants have been studied by using conductometric technique in the presence of various concentrations of additives (alcohols). The critical micelle concentration has been calculated and other related thermodynamic parameters have also been calculated. Gemini surfactants have very low hazardous effect on the environment. The various interaction parameters can also be calculated. They possess specific rheological and some specific aggregation properties. Therefore, it is not surprising that today they are widely used as effective emulsifiers, bactericidal agents, dispersants, antifoaming agents, detergents, etc.

**Keywords:** Alcohols, Gemini surfactant, mixed micelle, synergism.

**SYNTHESIS AND CHARACTERIZATION OF SOME THIOUREA COMPLEXES  
WITH TRANSITION METALS**

**Shamim Ahmad<sup>1</sup> and Shuyeb Ahmad Khan<sup>2</sup>**

<sup>1</sup>Bareilly College Bareilly, U.P.

<sup>2</sup>Islamia Inter College, Shahjahanpur-242001, U.P.

**Abstract**

Thiourea form a variety of complexes with transition metals. The complexes of substituted thiourea with Fe(II), Ni (II), Hg(II) & Cu(II) transition metals. The prepared complexes will be identified by I.R spectroscopy, magnetic susceptibility measurements. The antimicrobial activity of thiourea complexes of transition metals will be compared with antibiotics standard.

**Keywords:** Synthesis, Transition Metals, Thiourea Complexes, Antimicrobial Activity.

**THE GOVERNMENT ACTION, AGAINST DEFORESTATION TO CONSERVE ENVIRONMENT****Mohammad Tayyab and Rais Ahmad**

Department of Political Science, Gandhi Faiz-e-Aam College, Shahjahanpur, U.P.

**Abstract**

In this article the importance of forest will be discussed. The action taken by government through various rules and regulation to conserve our forest will also be part of it. The problems faced by all living creatures due to deforestation and also benefitslike transportation and rehabilitation from it will be analysed. The position of forests before independence and after that are explained and impact on environment is presented in this article, so constitutional aspects can be studied for future course of action.

**MEDICIANAL PLANT DIVERSITY IN WESTERN UTTAR PRADESH INDIA****Shazia Bi**Department of Botany  
G.F. College, Shajahanpur, (UP) 242001**Abstract**

The wealth of medicinal plants is one of the vital resources having important bearing on human health and the region's economy. Most pharmaceutical entrepreneurs associated with Ayurvedic and Unani system of medicine used crude drugs collected from plant resources in the recent past, and so the quality of crude drugs utilized has increased many times. Fortunately India endowed with many natural blessings in terms of human health and welfare such as congenial climate and soil for rich plant growth and in this connection medicinal plant gain special significance.

Recently efforts have been made to reveal medicinal plant diversity through ethnobotanical explorations. In India the literature on diverse native floras and medical uses of plant is voluminous. A perusal of literature reveals that Aligarh, Bareilly, Pilibhit and Shahjahanpur district of western Uttar Pradesh have never been surveyed from the ethnobotanical point of view. Such studies can doubtless help to discover new drug plants provided the studies are conducted significantly. Expeditions have been undertaken primarily by investigator interested in valuable information regarding the uses of plants for the treatment of different ailments.

**HISTORICAL ASPECTS OF BIODIVERSITY CONSERVATION IN INDIA****Mansoor Ahmad Siddiqui**

Department of History, G.F. College, Shahjahanpur-242001, U.P.

**Abstract**

This paper deals with the emergence and conservation of the concept of biodiversity and its rise of in India. It refers that how wilderness to the conservation of biodiversity grows and developed from the historical point of view. Though time is good healer, but the case is contradictory here. Due to hunger self-centred approaches of several exploitation behaviour and in turn human behaviour with certain precautionary measures by government have been discussed. My aim is to make understand the concept of biodiversity to the society. The need of the hour is to equate the demands of the "real world" with the address the most immediate issues of historians, activists, politicians, administrators, and technicians involved with the conservation of nature and the theoretical and methodological requirements. In this article approach is to make aware about the progressive steps taken to counter the challenges of biodiversity and its conservation in India. The steps were also taken for some suggestive measures to conserve and safeguard the Biodiversity.

**SYNTHESIS, AND SPECTROSCOPIC STUDIES OF THE CHARGE TRANSFER COMPLEX BETWEEN 3,5-DIMETHYLPYRAZOLE AS AN ELECTRON DONOR WITH  $\pi$ -ACCEPTOR 3,5-DINITROBENZOIC ACID IN VARIOUS POLAR SOLVENT**

**Kehkashan Alam\* and Ishaat M.Khan**

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**Abstract**

Nowadays, charge transfer complex has gained so much importance in biological field that been prepared by the interaction of equimolar proportion of good donor 3,5-dimethylpyrazole (DMPy) and  $\pi$  acceptor 3,5-dinitrobenzoic acid (DNBA) utilizing ethanol as solvent. The recently designed charge transfer complex has been characterized using various techniques such as UV-Visible, FTIR and  $^1\text{H}$ NMR spectroscopy. In UV-visible spectroscopy, the straight-line method of Benesi-Hildebrand equation is used to find out the stoichiometry of the charge transfer complex which is found to be 1:1 in this study. X-ray crystallography has been used to get the structure of the designed complex. The structural investigations display that the cation and anion are connected through strong  $\text{N}^+ - \text{H} \dots \text{O}^-$  type hydrogen bonds because of the transfer of proton from acceptor to donor. Photocatalytic activity has been tried against the toxic dyes under ultraviolet radiation for the complex which is utilized as catalyst.

**Keywords:** 3,5-dinitrobenzoic acid (DNBA), 3,5-dimethylpyrazole (IZ), X-ray Crystallography,  $^1\text{H}$ NMR, photocatalysis.



**MATHEMATICAL MODELING OF THE MOTION OF NANOPARTICLES****Musharraf Ali**

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Email: [drmusharrafali@gmail.com](mailto:drmusharrafali@gmail.com)**Abstract**

Nanotechnology is a very prominent domain in science and technology. There search proposal in this domain attract considerable funding. The presence research works in nanotechnology deal with physical, chemical, and biological themes or a merging of these domains, but very small number of works has been tackled on mathematical modeling. Mathematical models can largely minimizes the research expenditure. In this research article, we consider the mathematical modeling of the motion of nanoparticles inside the straight cylindrical tube.

**Keywords:** Mathematical modeling, Nanoparticles.

**IMPACT OF POLLUTION UPON UNDERGROUND WATER****Naseem Usshan Khan<sup>1</sup>, Ashfaq Ahmad\*<sup>2</sup>, Ramakant<sup>2</sup>**<sup>1</sup>Associate Professor, Department of Geography, Gandhi Faiz-e-Aam College, Shahjahanpur-242001, U.P.<sup>2</sup>Research Scholar, Department of Geography, Gandhi Faiz-e-Aam College, Shahjahanpur-242001, U.P.**Abstract**

Groundwater pollution occurs as a result of release of pollutants into the ground to natural underground water reservoirs known as aquifers. Once the pollutants released find their way into groundwater, they cause contamination. It is a type of water pollution that is mainly caused by release of substances either intentionally or accidentally through anthropogenic activities or natural causes. The pollutants usually move within aquifers depending on biological, physical, and chemical properties. Processes such as diffusion, dispersion, adsorption, and the speed of moving water often facilitate the movement. But in general, the movement of the contaminants within an aquifer is usually slow and as such, their concentration tends to be high and in a form called a plume. As the plume spreads it might connect with springs and ground wells making them unsafe for human consumption.

**SYNTHESIS AND CHARACTERIZATION OF SOME BIOLOGICALLY AND ANALYTICALLY ACTIVE TRANSITION METAL COMPLEXES**

**Devendra Kumar Gangwar**

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**Abstract**

In the present work Synthesis and Characterization of Co(II) complexes of diacetyl semicarbazone (DASC) are reported. Complexes were characterized by elemental analysis, magnetic moment susceptibility, infrared, electronic and EPR spectral studies. All the semicarbazone complexes of Co(II) have the composition  $\text{Co}(\text{semicarbazone})_2\text{X}_2$  where  $\text{X}=\text{Cl}^-$ ,  $\text{NCS}^-$ ,  $\frac{1}{2}\text{SO}_4^{2-}$ ,  $\text{CH}_3\text{COO}^-$ . Since semicarbazones are known to act as bidentate chelating agents coordinating through oxygen and the C=N nitrogen, the above complexes may be four coordinate, Five coordinate or six coordinate depending upon the number of anions involved in coordination. These complexes were found to be biologically and analytically active.

**SYNTHESIS AND APPLICATION OF MUSA ACUMINATA AS A POTENTIAL ADSORBENT FOR THE TREATMENT OF INDUSTRIAL EFFLUENT: A REVIEW**

**Ummul Khair Fatma and Gulrez Nizami**

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Mohammad Ali Jauhar University, Rampur, UP 244901, India  
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**Abstract**

The present study is a review of application of *Musa acuminata* (Natural Banana) in the form of potential adsorbent. Banana peels and its trunk have been proved efficient adsorbent for the adsorption of heavy metals, radioactive metals and toxic nonmetallic pollutants. Banana peels due to its availability and low cost might be promising adsorbents for the cleaning and purification of the environment. In this paper the authors attempted to study and review the significant research carried out on the selected study area in terms of its effectiveness in the removal of contaminants from the water in an efficient way. The efficiency of adsorbents prepared depends on the pH difference, contact time and dosage.

From the entire study it is concluded that banana trunk and peels has substantial potential for removal of heavy metals, radioactive metals and other non metallic elements from aqueous solution.

**Keywords:** adsorbents, radioactive elements, contact time. pH difference

**RENEWABLE AND GREEN ENERGY****Pradyumn Kumar**

Department of Geography, V.R.A.L. Rajkiya Mahila Mahavidhyalay, Bareilly.

**Abstract**

Energy is an essential input for economic development and improving the quality of life. There is direct relation between the level of economic development and per capita energy consumption. There are two main sources of energy conventional energy and non conventional energy. Energy and sources of energy are the natural energy resources which are present in a limited quantity. They are called non renewable sources. These resources have been depleted to a great extent due to their continuous exploitation. Some common examples of conventional sources of energy include coal, petroleum, natural gas etc. They pollute the environment by emitting harmful gases and also contribute to global warming renewable energy are sources of clean, inexhaustible and increasingly competitive energy. They differ from fossil fuels principally in their diversity, abundance and potential for use anywhere on the planet, but above all in that they produce neither green house gases non polluting emissions.

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## گلوبل وارمنگ: اسباب، نتائج اور حل

ڈاکٹر نسیم احمد

اسٹینٹ پروفیسر، شعبہ اردو

گاندھی فیض عام کالج، شاہجہانپور

معروف امریکی سائنسدان David Grinspoon کا قول ہے:

"Fixing global warming is more important than astronomy."

انسان سے متاثرہ ماحولیاتی تبدیلیوں اور گلوبل وارمنگ کی وجہ سے سارے عالم میں گرم لہروں میں اضافہ ہوا ہے۔ اور ہمارا ملک بھی اس سے اچھوتا نہیں ہے۔ اوزون کی تہہ کا کمزور ہونا، انٹارکٹیکا میں برف کے تیزی سے پگھلنے سے سمندروں کی سطح کا بلند ہونا، موسموں میں شدید تبدیلی ہونا یا پھر تیزی سے درجہ حرارت میں اتار چڑھاؤ، قبیلوں کے زہریلے دھوئیں سے سانس کی بیماریوں کا عام ہونا یا پھر آکسیجن کی مقدار کا گھٹنا یا کاربن ڈائی آکسائیڈ کی مقدار میں اضافہ۔ یہ سبھی وہ مضر اثرات ہیں جو اس خوشنما سیارہ پر مقیم تقریباً سبھی Species کو نگل جانا چاہتے ہیں۔

گلوبل وارمنگ یا عالمی حرارت زمین کی سطح کے درجہ حرارت میں رونما مستقل و مسلسل اضافہ کا نام ہے۔ یا یوں کہیے کہ اس سے مراد آب و ہوا کی تبدیلی ہے جو زمین کے درجہ حرارت کے اوسط میں اضافے کا سبب بنتی ہے۔

موسمیاتی تبدیلی پر انٹرنیشنل پینل (آئی پی سی سی) کی پانچویں تشخیصی رپورٹ کا اختتام ہوا جس میں موسمیاتی نمونوں کے تخمینے کے خلاصہ میں یہ اشارہ کیا گیا کہ اکیسویں صدی کے دوران عالمی سطح کے درجہ حرارت میں تقریباً 0.3°C سے 1.7°C (0.5°C سے 3.1°C) کے

## آبی آلودگی: عہد حاضر کا اہم چیلنج

ڈاکٹر تجمل حسین

پانی کے ذخائر تالاب، جھیل ندی اور نالوں میں غیر قدرتی اجزاء کے شامل ہونے کو آبی آلودگی کہتے ہیں۔ پانی قدرت کا ایک حسین تحفہ ہے اور یہ انسانی زندگی کا ایک لازمی جز ہے۔ بارش کا پانی سب سے زیادہ صاف و شفاف ہوتا ہے۔ صاف پانی نہ صرف صحت مند انسانی زندگی کے لیے کارآمد اور مفید ہے بلکہ پیڑ پودوں اور جانوروں کے لیے بھی حیات بخش ہے۔ برسات کے پانی کا تذکرہ کرتے ہوئے نظیر اکبر آبادی کہتے ہیں

ہیں اس ہوا میں کیا کیا برسات کی بہاریں  
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## Results on Construction of Disjoint Spectra Cryptographic Functions

Abdul Salam<sup>1</sup>, Mujeeb-uddin<sup>1</sup>, Jinamul Hasan Khan<sup>1</sup> and Deep Singh<sup>2</sup>

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<sup>2</sup> Department of Mathematics, Central University of Jammu, Samba, J&K, India  
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**Abstract.** The investigation of nonlinearity and resiliency of cryptographic functions is a crucial criteria with respect to protection of ciphers from affine approximation and correlation attacks. Constructions of disjoint spectra Boolean functions by concatenating the functions on lesser number of variables are of special interest. In this paper, we have listed few such disjoint spectra functions where the profiles of the functions declare their nonlinearity and resiliency.

**Keywords:** Walsh-Hadamard transform (WHT), affine approximation attack, resiliency; nonlinearity, disjoint spectra functions

**SES 81****ABSTRACT**

**ROLE OF EDUCATION TO CONTROL AIR POLLUTION PROBLEM AND WASTE  
WATER TREATMENT**

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G.F.College, Shahjahanpur  
Email: [anandmpande@gmail.com](mailto:anandmpande@gmail.com)

**Abstract ᳚ ᳚ { k i r } / 2**

or᳚ku l e ; e a e u t ; d h f o f f l k U u x f r f o f / k ; k a d s d k j . k ' k j } & o k ; q e a f o f f l k U u t g j h y h x S k j d k c f u d i n k F k k j } / k m y d s d . k k a r F k k e s / s y d d . k k a d h l k n r k c < r h t k j g h g a f t l i s o k ; q i n i k . k c < F k t k j g k g a o k ; q i n i k . k c < k u s o k y s d k j d i n i k d (Pollutant) d g y k r s g a ; g i n i f ' k r o k ; q f o f f l k U u i z l k j l s t h o k j e u t ; , o a o k r k o j . k i j i f r d n y i t h k o M k y j g h g a o k ; q i n i k . k d e d j u s d s f y , f o f f l k U u o h u r d u l f d ; k a d k i z l x v k o ' ; d g a m R i k n u d s { k s = e a f o ' k s k d j d s v k s / k h ; (medicine) m R i k n u d s { k s = e a g j r j l k ; u (Green chemistry) d h r d u l f d d k i z l x d k Q h l d k j k R e d i f j . k k e n x c h A i n i k . k d h l e L ; k , o a f u o k j . k d s f y , i k j E H k l s g h b l s f ' k { k i k B ; Ø e e a ' k k f e y d j y u s l s y k c l a e a v f / k d t k x : d r k j g s c h r F k k v f / k d l d k j k R e d i f j . k k e i k i r g k a c A b l h i z l k j n i f ' k r t y t k s v k s k k s d l e L F k k u k a , o a ? k j k a l s v k r k g S d s m i p k j e a t g k ; f o f f l k U u f o f / k ; k a d k m i ; l x d j d s b l t y d l s l o P N l k r k a r d h k s t r s g a o g h a ; f n f ' k { k d s i k B ; Ø e e a n i f ' k r t y l s g k u s o k y h g k f u ; k a v k j t y d l s f d l h h k h f o f / k (Process) e a d e l s d e n i f ' k r d j u s d h t k u d k j h c P p k a d k s f ' k { k d s e k / ; e l s i k j E H k l s g h i n k u d j a r k s t y d s n i f ' k r g k u s d k s f u ; i = r f d ; k t k l d r k g S r F k k b l d s m i p k j e a v k u s o k y s v u k o " ; d 0 ; ; (Investment) d l s d e f d ; k t k l d r k g a

**Keywords – i n i k d (Pollutents) ; k s x d (Compounds) j s M ; s ' k u (Radiation) m i p k j (Treatment) v k s u M L V d k m U V j (Owen's dust counter)**

## DEVELOPMENTS TO SIPLIFY WASTE MANAGEMENT

**Lavi Sigh, Mily Srivastava, Anchal Kumar, Sabih Aliya, Afzal Ansari, M. Azeem**

Department of Chemistry, G.F. College, Shahjahanpur, U.P.

### Abstract

The biggest problem of today is piles of nonbiodegradable articles chocking the sigh of life. In the earth on the earth and above the earth there is chronic pollution level due to use of those items which are used ones and discarded as litter. There are so many materials which are decomposed by microorganism over a due period of time into its constituent elements, get free in the soil and air to form new compounds. In this way the waste material gets vanished from earth surface. But with the advancement of research and knowledge man tried to discover and synthesize those materials which are long lasting and easy to use. In this trial he manufactured wonderful materials for comfortable life style. But the hidden drawback of this comfort was observed very late when we get encircled by mountains of rubbish of those materials which are not going to be decomposed by microorganism. Some examples of nonbiodegradable materials are water bottles, metal scraper Styrofoam, plastic bags, etc. In order to minimize this waste there is need of manufacturing of biodegradable materials and reuse and recycling of non-biodegradable materials.

**KeyWords:** Non-biodegradable, Pollution, Solid Waste Management,

**INNOVATIVE TECHNIQUES TO RECYCLE PLASTIC****Manoj Kumar, Sidra Khan, Ariba Tarruf**

Department of Chemistry, G.F. College, Shahjahanpur, U.P.

**Abstract**

In India and other developing countries plastic forms a big part of solid waste and its use is continually increasing at an accelerated rate. Being highly stable and non-biodegradable its disposal is a tough task. In order to reduce the net amount of plastic from the earth surface we have to change our habits of using plastic articles and dumping them in garbage. Reduce, reuse, recycle and replace these four R are new mantra to fight against the dreadly accumulating solid waste in our environment. This slogan tells that reduce the use of plastic goods like water bottles, bags sheets, containers, pipes, etc. and try to use same item of plastic for more than one time so that the demand of plastic items will definitely lower down. Another part of this movement is recycling of used plastic. In mechanical recycling method waste plastic is collected, separated washed and melted then in liquid state it is converted into new item about 2000 tonnes of plastic waste are recycled every day in India by mechanical recycling. But this method is not sufficient to find a solution of such a giant problem of pollution caused by plastic, so more efficient techniques are required. Incineration and gasification of plastic waste are new techniques are developed by Germany, offers the best plastic recycling option. In this method waste solid is burnt at very high temperature and converted into gaseous form and can be utilize in many useful work.

**Key words:** Garbage, Plastic waste, Recycling

## **SIGNIFICANCE OF BIODEGRADABLE POLYMERS IN DRUG DELIVERY SYSTEMS**

**Shikha Mishra, M. Zubair Khan, Swati Chauhan, Somya Saxena, Krishn Kumar and  
Subhana**

Department of Chemistry, G.F. College, Shahjahanpur, U.P.

### **Abstract**

Polymers are playing significant role in day to day life and in many specific applications in engineering-technology and biomedical applications such as in soft tissues engineering and other implants of parts. Biodegradable elastomers overcome many limitations as they have ability to recover from multiple deformations. Citric Acid based biodegradable polymers are a family of elastomers that have been recently developed. Numerous castor oil based polymers with different acid have been synthesized and tested for many biomedical and bio-engineering applications. Furthermore, still more researches are required, especially in the area of biodegradation and biocompatibility. Efforts have been made in present communication to overview the works carried out in his regards to make a comprehensive study for further research.

**Keyword:** Biopolymers, drug delivery system, elastomers.

**SES 85****ABSTRACT****ANTIMICROBIAL EFFECTS OF NATURAL PRODUCTS PRESENT IN NATURAL RESOURCES**

**Fahad Ali Khan, Anjali Gupta, Eram Fatima, Atif, Brijesh Kumar and Kusum Deep**  
Department of Chemistry, G.F. College, Shahjahanpur, U.P.

**Abstract**

Natural products of plants origin and their components have been used to cure the variable diseases all around the globe since ancient times long before the discovery of current pharmaceuticals. Natural resources bestowed by the nature have promise to low adverse after effect, easily available at comparatively cheaper cost. Furthermore they have ability to grow again and again as per demand. Natural products have long been used as anti-inflammatory, analgesic and antipyretic remedies in addition to alternatives for hormone replacement therapy. In present communication efforts have made to overview the different natural products and their derivatives utilized as antimicrobial agents in vitro and in vivo studies.

**Keyword:** Natural products, antimicrobial effect, natural curing agents

**SES 86****ABSTRACT****NTA ENHANCES LEAD UPTAKE BY SUNFLOWER**

**Babli, V.P Singh and Alok Srivastava**  
Department of Plant Science  
M.J.P ROHILKHAND UNIVERSITY, U.P, INDIA

**Abstract**

Phytoremediation is a green technology to remediate heavy metal pollution. The study deals with the Phytoremediation potentiality of Sunflower in lead contaminated soil. The lead was applied through irrigation in the field after sowing Sunflower seeds. At 45th day the analysis was made and found that the biomass of Sunflower in lead contaminated soil did not affect even at higher lead concentration. The Sunflower accumulated almost 52% of the total lead present in soil. The application of NTA further enhanced the accumulation by 26%. No leaching effect was seen of NTA and root hairs were found intact. The accumulation was more in shoots than in roots. So NTA can be better chelator than other chemical chelators.



**Spectral, Catalytic, Antifungal activity and Electrochemical properties of some  
Ni(II)/Ru(II)/V(II) Carbonyl Complexes with N,O Donor Schiff Base  
4-Ethoxybenzaldehyde-N-4'-Cytidinylazomethine**

**Pratibah Singh**

Department of Chemistry  
Vardhaman College, Bijnor (U.P.) India

**Abstract**

A new schiff base (4-EBLCA) derived from cytidine nucleoside and 4-Ethoxybenzaldehyde and new nickel (II), Ruthenium (II) and Vanadium (II) carbonyl complexes derived from above schiff base and another schiff base 4-Hydroxybenzaldehyde-N-4'-cytidinylazomethine (4-HBLCA) were synthesized. The complexes were characterized by a combination of Elemental analysis,  $^1\text{H}$  NMR, FT-IR,  $^{13}\text{C}$  NMR and Mass spectra. Two of the newly formed complexes have the property to act as good catalysts for the oxidation of alcohols into corresponding Carbonyl compounds. The complexes have been screened for their antifungal potential against some fungal strains viz-*Aspergillus niger* and *Aspengillus flavus* by filter paper disc method. The metal complexes were more antifungal active than those of free ligand. In all these complexes, the schiff bases are bonded to the central metal ion through its N, O and azomethine N.

**Keywords:** Schiff Base 4 Ethoxybenzaldehyde-N-4'-Cytidinylazomethine,  $^1\text{H}$  NMR, Mass spectra, Antifungal activity.

## Theme Area: Waste Minimization and Prevention

**WMP 01****ABSTRACT**

### **MICRO-WATERSHEDS UNDER THE RISK OF SOIL EROSION: A CASE STUDY OF ETIOPIAN HIGHLANDS**

**Estifanos Abera<sup>1</sup> and Mushir Ali<sup>2</sup>**

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2. Department of Urban Planning and Development, Ethiopian Civil Service University, Addis Ababa, Ethiopia:  
Email: [mushir.ali@ecs.u.edu.et](mailto:mushir.ali@ecs.u.edu.et)

#### **Abstract**

Blue Nile Basin is one of the largest basins found in highlands of Ethiopia characterized by high population pressure, degradation of land and highly dependent on agricultural economy. Lake Tana Sub basin has a major contribution to the Nile river basin, deforestation and overgrazing, soil erosion, sediment deposition, storage capacity reduction, drainage and water logging, flooding, pollutant transport, overexploitation of specific fish species, the land and water resources of the sub-basin and its ecosystem are in high risk. The main objective of this study is assessment of the most erosion vulnerable micro-watersheds in Ribb watershed. This is because; it is difficult to launch soil and water conservation and other environmental protection projects in all micro-watershed at the same time. So, the most erosion vulnerable micro-watersheds have to be identified. The results indicate the potential average annual soil loss of the micro-watersheds ranges from 10.93 to 95.5 ton/ha/year with a mean annual soil loss of 39.8 ton/ha/year. The upper five micro-watersheds shows very high mean soil loss rate. These micro-watersheds are comparatively more vulnerable to erosion and needs immediate action for conservation and environmental protection activities.

**Keywords:** Soil erosion, micro-watershed, risk, LULC, GIS and RUSLE.

**A REVIEW ON THE SOME CONDUCTING POLYMERS AND THEIR APPLCATIONS**

**Basant Kumar and Azad Kumar**  
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**Abstract**

Conducting polymers (CPs) have drawn the significant attention of researchers for more than three decades because of their economic importance, superior stability, lighter weight, better workability, resistance to corrosion and satisfactory electrical conductivity. Some of the applications of CPs include: rechargeable batteries, electrochromic display devices, light reflecting or light transmitting appliances for optical information, sensors and storage for glare reduction systems and smart windows in automobiles and buildings, polymeric light emitting diodes, photovoltaic devices, transistors, electromagnetic shielding against electro-magnetic interferences and printed electronic circuits.

**Keywords:** Conducting polymers, rechargeable batteries, electrochromic display devices, light reflecting.

**UNDERGROUND WATER POLLUTION AND ITS IMPACTS ON ENVIRONMENT****Arvind Kumar and D.K. Sinha**Department of Chemistry  
K.G.K. (P.G.) College, Moradabad (U.P.) India**Abstract**

Water is one of the most priceless gifts of the nature. Life is supposed to have originated in water and adequate supply of fresh and clean drinking water is a basic need for all living species on the earth. Ground water is a natural resource for drinking water and it should be assessed regularly and people should be aware about the drinking water quality. Ground water samples were collected from the handpumps and wells for the study and analysed by standard methods. Attention on water pollution and its management has become a need of hour because far reaching impacts on human health.

**Keywords:** Ground water, pollution, environment, human health.

## LIFE CYCLE OF THIN FILM SILICON SOLAR CELL AND ENVIRONMENTAL POLLUTION

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### Abstract

Photovoltaic or solar electricity is a promising renewable energy technology that is rapidly approaching mainstream feasibility. Technological advancements are constantly being made in the solar cell industry. But as with any industrial product, an environmental impact factor is also involved & associated with solar photovoltaic panels. In this paper our potential concerns are: the energy required to produce them (particularly the photovoltaic cells), what happens to them at the end of their lifetime and toxic & other potentially harmful materials used or created in the production of PV panels/cells. Depending on cell processing technology and production of PV panels energy pay-back times are now decreased considerably ranging from 2 to 5 years. Thin film technologies are at the lower end of this range. For silicon technology clear prospects for a reduction of energy input exist, and an energy pay-back of 1 year may be possible within a few years. Here attention is made on the negative environment impact of full life of thin films from production to disposal.

**Keywords:** Photovoltaic, Environmental Impact, Energy pay-back.

**MUNICIPAL SOLID WASTE: A POTENTIAL SOURCE OF RENEWABLE ENERGY**

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**Abstract**

Municipal solid waste consists of food waste, paper, cardboard, plastics, PET, glass, textiles, metal, wood, ash, and leather etc. It is a big challenge for environment in urban India. India has more than 5000 cities and towns, from which about 40 million tonnes municipal waste is produced annually. TERI estimates it to be 260 million tonnes by 2047. Heaps of garbage is seen in metro cities. It is one of the most serious issues arising due to rapid urbanization. It is a potential source of recycling materials, heat and energy. In developed countries this waste is used as resource to produce energy and compost; whereas in developing countries like India, collection, transportation and disposal of MSW are a big task. In developing countries, wastes to energy technologies (WTE-T) are the solution for problem of MSW, by which waste can be converted in to energy. These include biological treatment technologies, thermal treatment technologies, landfill gas utilization technologies and Biorefineries. Thermal Treatment technologies use process of pyrolysis, gasification and incineration. In developed countries Integrated Solid Waste Management Systems (ISWMS) are being used for management of MSW.

**Keywords:** Gasification, Incineration, Municipal solid waste, Pyrolysis, Renewable energy, Syngas.

**PHYSICO-CHEMICAL STUDIES OF INDUSTRIAL EFFLUENTS AND POLLUTION  
POTENTIAL OF THE RIVER IN DIFFERENT SEASONS**

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**Abstract**

The total amount of water above, below and on the surface has been estimated to be  $1.33 \times 10^{24}$  kg which is about 5% of total mass of the earth and is about 8% of the earth surface, 1001million  $\text{km}^3$  of the total water present only  $33400\text{km}^3$  of water is available for drinking, agriculture, domestic and industrial consumption .Surface water differ in temperature between winter and summer.

**Key Words:**-Physico Chemical, Potential, MPN, Coliform, pH, DO.

**NECESSITY OF ENVIRONMENTAL AWARENESS AND EDUCATION****Naseem Usshan Khan and Pancham Kumar**Department of Geography  
G.F.College, Shahjahanpur**Abstract**

According Rigveda which is older, “The dust (Dhula) of mother earth and light of father sky should remain be associated with full brightness for our welfare”. According to Rigveda, there are three kind of god-the celestial, the aerial and terrestrial i.e. land, air and water. Brihasparti is most important, means awareness of these mandals. The whole Brahmanda was full of peace and happiness because life and environment were so closely related that it was difficult to think man and organism as something separate from nature or environment.



**BIO PLASTIC****Sachin Gihar**Department of Chemistry  
VRAL Govt. Girls Degree College, Bareilly, U.P.**Abstract**

Now a days the economic development of any country is also influenced by the production of plastic materials in that country. A wide variety of plastics raw materials are produced to meet the material needs of different sectors of the economy. Plastics industry is one of the fastest growing industries in India. It has expanded at ~8% over the last five years to reach ~8.5 MnTPA (million tonnes per annum) in FY 13 from ~6 MnTPA in FY 08. . There are various disadvantages of using conventional plastic like CO<sub>2</sub> production, non-degradable in nature etc. Therefore a new type of plastic called bioplastic or green plastic has come into existence. These bio plastic are made of biodegradable materials and have lower CO<sub>2</sub> production and are renewable. The common bioplastics available in market like PLA (Poly lactic acid), PHA (Polyhydroxylalkanoate), PE (Polyethylene), PCL (Polycaprolactone) etc.

**Keywords:** Bio-plastics, Bio-degradable; CO<sub>2</sub>; PE; PHA; PVC; PLA; PA; PCL: Food industry; Packaging industry.

**SOLID WASTE GENERATION AND ITS IMPACT ON HUMAN HEALTH (A  
GEOGRAPHICAL STUDY IN PILIBHIT CITY, U.P.**

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**Abstract**

Open dumping is the most common method of solid waste disposal in many developing countries including Urban areas. Appropriate landfill site selection is important to minimize negative impacts associated with open dump sites. Landfill sitting is an extremely difficult task to accomplish due to strong public opposition and regulations. Developing countries do not have a systematic process for landfill site selection and hence unsuccessful landfill sitting leading to environmental degradation is typically the result especially in the developing world. Selection criteria include engineering, maintenance, management and analysis of geographical data and its has bend signed for working with data that has spatial and descriptive dependency. No sits selection study focusing on waste disposal has been performed in (NPP) Pilibhit town of U.P., area which is located at 312 km East of Delhi & 265 km towards south, Lucknow population 1.28 Lakh (2011) people and total waste production of approx. 2924 ton per year. Weather 17<sup>0</sup>C wind wat 11km/h 68% humidity in NPP Pilibhit. This study has been done using guidelines for selection of site from residential area distance from roads, land use distance from ground water distance from falt geology distance from sensitive ecosystem etc. were used and after data Geo referencing, the weighting of the criteria and adjusting them with the geographical features of the area, data overlaid and finally in two locution proposed for landfill were introduced in Pilibhit town.

**Key Words** : Solid waste, Landfill site, Analytical Hierarchy process, GIS, NPP Pilibhit, Generation.

**RULES TO PROTECT THE ENVIRONMENT: A POLITICAL APPROACH****(With Special Reference to Air and Water Pollution)****Rais Ahmad**Deptt. of Political Science  
G.F.College, Shahjahanpur (U.P.)

As the great philosopher Aristotle said “Man is a social animal”. It means he can’t live without society. Further, Russian philosopher added “Every where he is in chains”. If we combine views of both the Philosopher then, we find that every human being is interconnected and can’t stay without to each other. Hence it is clear that whatever he does, it affects every human being. The God has provided everything to all creatures on this earth, still he faces lot of problems economically, socially, and physically. This is because, whatever natural resources gifted to us, we are unable to procure and secure them. Beside this we are unnecessarily and lavishly using these resources daily without worrying about our future. Study reveals that at present the biggest menace to the human race on the planet earth is environmental issue. It challenges us physically, mentally and psychologically every day. The environmental problem which is worsening gradually, required to be paid more attention, so its harmful effects on the human being and on planet earth can be rectified.

**SOLID WASTE DISPOSAL AND MANAGEMENT**

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**Abstract**

**This chapter discuss methods of solid waste disposal and management which are** Open burning, Dumping into the sea, Sanitary Landfills, Incineration, Composting, Ploughing in fields, Hog feeding, Grinding and discharging into sewers, Salvaging, Fermentation and biological digestion.

**Keywords:** Composting, Fermentation, Salvaging, Sanitary Landfills.

**SINGLE-USE PLASTIC BAN: A BOON OR A BANE****Shiva Mahzavi**

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A teeny village Lachung in the north-eastern state of Sikkim, India has waged a war against single-use plastic. The village launched the plastic ban in 1998 and instead of plastic, they have been incessantly using handcrafted eco-friendly articles and containers as an alternative. Lachung has set an example for the rest of the world by creating awareness about single-use plastic hazards to resolve and combat ecological imbalance.

**MESAAGE OF AWARENESS AND LOVE FOR NATURE IN THE POETRY OF  
WILLIAM WORDSWORTH**

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To save the environment is not an issue, it is a survival truth. Today, individuals, organisations and governments need to come together and join hands to save and protect environment. The less human beings pollute the environment, the more they prevent global warming. A stand against deforestation must be taken soon. Losing the rainforests means loosing millions of trees that clean the air for us. So, there is a need to teach our children to respect nature and its objects.

The study of William Wordsworth's poetry shows that he is the great worshipper and high priest of nature. According to him, there is a mutual consciousness, spiritual communion or mystic intercourse between man and nature. He establishes a new idea of family resemblance in man and nature. For him nature is the mother and all creatures of this world including man are her sincere and obedient children. He favours and supports the idea that human beings who grow up in the lap of nature are perfect and poised in every respect.

**CORROSION PROTECTION OF COPPER BY POLYSULPHONE/  
POLYACRYLONITRILE BLENDS**

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**Abstract**

Polysulphone/polyacrylonitrile blends (PPBs) were synthesized through reactive blending of polysulphone (PSF) and polyacrylonitrile in N-methyl pyrrolidone (NMP) under microwave irradiation at 75W over 20 min in series. Monitoring of reactive blending process was done through 2,2'-azobis isobutyronitrile ( $6.0 \times 10^{-4}$  mol/dl) initiated insitu polymerization at varying concentrations (mol/dl) of acrylonitrile from  $9.0 \times 10^{-3}$  to  $21 \times 10^{-3}$  with PSF (50%, W/V, 10 ml) in NMP. Characterisation of PPBs were done through diversified spectral, thermal, microscopy and electrochemical methods. Electrochemical impedance spectra (EIS) and DC polarization in sodium chloride (0.25M) were used to evaluate the PSF for the corrosion protection of copper. Electrochemical data reveals the enhanced corrosion protection of PPBs over PSF for copper. Generally, coating of PPBs displays marginal delamination at rate of 0.53mm/yr in 29h. This work illustrates the corrosion protection of copper through coating of PPBs and in the same manner this can be executed for protection of other metals using polymer blends in saline media.

**WASTE MANAGEMENT INITIATIVES IN INDIA FOR HUMAN WELL BEING****Barkha**

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**Abstract**

The objectives of writing this paper is 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