Plenary Lecture 1

Sustainable Polymers from Biomass: Bridging Chemistry with Materials and Processing

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Polymer is one of the most versatile materials having myriad of applications - from packaging to biomedical devices. Of late, the glittering concept of ‘sustainability’ has been able to infiltrate within the domain of polymer science and technology to significant extent - in both academia and industries. This field continues to grow rapidly. Along with polymer, other ingredients that are used to make polymer compounds and products would also be sustainable in future.

Sustainable materials are defined as materials that can be produced without depletion of non-renewable resources and without disturbing the equilibrium between the environment and key natural resource systems. The range of these materials is huge – from natural rubber, bio-derived monomers and polymers to recyclable materials, etc. How the future polymeric materials could be developed using scientific principles would be discussed in this presentation. It is also interesting to demonstrate how science is helping to restore environment and society.

The focus of our research program since the last ten years has been to design and synthesize monomers and polymers from agricultural waste products, utilize bio-based monomers for synthesis of high performance polymers and understand structure-property relationship. In this context, cashew nut shell liquid (CNSL) and lignin-derived aromatic chemicals were explored as renewable starting materials to generate a library of difunctional monomers suitable for preparation of high performance polymers. The emphasis of the presentation will be on how chemistries of monomers and polymers improve materials properties in conjunction with processing methods.
Plenary Lecture 2
Sustainable organic synthesis via hybrid nanomaterials

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Abstract:

Heterogeneous catalysis, is at the heart of the modern chemical industries and most of the chemical processes, both established1 and emerging,2 are performed using functional nanomaterials as catalysts. The catalytic efficiency of the nanomaterials is due to their added advantage of high selectivity, activity, low energy consumption, and long lifetime. Several solid base catalysts such as zeolites, metal oxides, mixed oxides, hydrotalcites etc. have been developed for the manufacture of organic intermediates and fine chemicals, among them metal oxides such as MgO, CuO, and ZnO are of especial interest. During the synthesis of medicinally relevant molecules, 3 we became interested to develop nano catalytic system that can be used for more than one organic transformation. To achieve these objectives we synthesized various nano-materials and studied their catalytic potential for A3 and KA2 coupling and related organic reactions.4 Some of the organic molecules synthesized during this work have been evaluated for antimalarial activity and have exhibited potent in vitro and in vivo antimalarial activity.

References:
Invited Talk 1
Dielectric Elastomer-based Actuators and Generators

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Abstract:

Recently, elastic function of rubbers has attracted a great attention for various applications including stretchable displays, translucent or transparent smart devices, dielectric elastomer actuators, sensors, and generator. The principle of electroactive rubber (EAR) is that when the electrical field, thus the resulting Maxwell force applied to the sandwiched rubber film via stretchable electrodes compass the compressive modulus of rubber, the rubber film will collapse to expand. When the electrical field is removed, the expanded rubber film will recover due to the rubber elasticity. The EAR can be used as dielectric elastomer actuators (DEAs), dielectric elastomer generators (DEGs), and stretchable electrode (SE). DEAs also known as artificial muscles, are a new type of soft transducer consisting of a thin elastomer membrane sandwiched between two compliant electrodes. DEGs have been developed to harvest electricity by scavenging mechanical energy from diverse sources including ocean waves, wind, and human movements. This presentation will cover some recent applications of EAR in fabrication of bubble shaped actuator, liquid lens, disk-shape rubber generator, and stretchable electrodes (see Figure 1).

Figure 1. Recent applications: (a) prism control 1 (b) liquid lens 2, and (c) thin film optical lens 3.

References:


Keywords: Dielectric elastomer, Actuator, Generator, Stretchable electrode

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Invited Talk 2
Programmable nanosystems and digital devices for cloud medicine

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Abstract
Development of dynamic nanotechnology with artificial intelligence (AI) functions is a key element for the future biomedical and home care devices.1 A wide variety of permutations of functional features have been directed towards progressing cutting-edge healthcare nanomaterials, thus producing a plethora of high-performance biosensors, smart theragnostics and self-powered systems and devices. Systematic triggered techniques have received significant attention in the recent years due to their unique tunable property and adjustable binding ability upon receiving stimuli.2-3 Novel approaches include on/off-switchable or smart surface affinity via changing temperature, pH, light intensity, magnetic field and potential for analytics. However, most of the stimuli have been restricted to light, magnetic field and pH.4-5 Triggered surface responsiveness paves the way for smart medical nanotechnology that not only have tunable retention, but also provide diagnostic and/or therapeutic capability through a ‘built-in’ programming of integrated bio-systems. Stimuli-responsive nanosystems answer by a considerable change in their properties to small changes in their environment for example a) physical- temperature, electric or magnetic fields, and mechanical stress; and b) chemical effectors- pH and ionic factors, chemical and biological agents (Fig. 1). New smart bioengineered dynamic nanosystems are being formulated that sense specific environmental changes and adjust in a predictable manner, making them useful biomedical tools. The progress in this field would make significant contributions to advanced medical technology, bioelectronics, nanomaterials and nanotechnology.6-7 The aim of my talk is to discuss various strategy of cutting-edge intelligent dynamic nanosystems for new age healthcare applications.8

Fig. 1. Dynamic nanobiosystems prevalent to create smart interfaces for inducing interfacial engineering in structures inbedded into the digital healthcare networks.

References
Rational Ligand Design For Providing Highly Efficient Catalytic Solutions in Academia and Industry

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Abstract:
Transition-metal catalyzed processes have revolutionized organic synthesis in the past several decades providing excellent reactivity and selectivity. Advancements in this area have been brought about by the introduction of modular ligand systems, which through steric and electronic factors influenced the reactivity of the transition metals, thus providing solutions to a variety of synthetically challenging problems1. One such problem that has plagued the synthesis of substituted heteroarenes (with promising biological activity) is to find an efficient catalytic system that could activate C-Cl bond in chloroheteroarenes at close to ambient temperature. In spite of the availability of sterically bulky and highly electron-rich Buchwald-type of phosphines-based ligands as well as the N-heterocyclic carbene ligands, a sustainable solution to this problem has not been found till date. Recently, we have reported on the application of phosphadamantane-based ligands namely, PTABS and PTAPS (containing a sulfonate group for better water solubility) for the modification of nucleosides in water under palladium-catalyzed cross-coupling conditions2,3. Application of the Pd/PTABS catalytic system for C─N, C─O, C─S bond formation in heteroarenes proved to be extremely useful as a room temperature amination4 low temperature etherification (60 °C)5, low temperature thioetherification (<60 °C)6 was achieved via the C─Cl bond activation in chloroheteroarenes.

References:
Invited Talk 4
Controlling and fine tuning of the molecules:
Functional Structures on the Nanoscale

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Abstract:

Machinery of life was developed biologically in long-term evolutionary processes, and there is no protocol about the experiments, which finally succeeded. Chemists have been successful with synthesis, isolation and analysis but not with the reproduction of the working molecular apparatus. The introduction of supramolecular self-assembly approach as an engineered phenomenon allowed us to address one of the great challenges on nanoscale level – the separation, containment and manipulation of individual molecules and allow studying molecular interactions, which would make it possible to answer some simple biological questions experimentally on nanoscale level, which are difficult to approach in complex biological modules.

Supramolecular chemistry offers a paradigm shift for fundamental chemical research through hybridisation of organic, physical, inorganic, theoretical and biological sciences that focused on the development of emerging technologies for creation of functional material1. For supramolecular self-assembly and self-organization of small organic molecules, new synthetic strategies are employed, whereby designer building blocks self-associate in a predictable fashion to form cutting edge materials.

As a part a more diverse research program within our group in supramolecular chemistry, my team have been exploring new approaches to combating several unanswered questions in sciences. For example:

Can small molecules are sensitive and selective enough for sensing applications?
Are small molecules a valid approach for development of luminescent material?
Can the Photosynthetic Reaction Centre (PRC) effectively mimicked by synthetic systems for energy transduction?
Are small molecules a valid approach for molecular electronics?

In this presentation, I will highlight the work of my team based on small organic molecules and present their achievements in relevant fields2-4. This talk will focus on discussion of innovative and cutting-edge research program on smart functional material on the nanoscale level and their applications such as molecular recognition, environmental (purification, separation), energy (solar cells), and drug delivery.

References

3S. Bhosale et al. Science, 84, 2006, 313.
Invited Talk 5
Supramolecular Self-assembly for Creating Nanostructured Biomaterials

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Abstract:
Design of suitable chemical architectures that undergo spontaneous self-assembly to produce soft materials with desirable properties is being keenly explored by researchers across the world. We have created a series of amino acid derivatives that self-assemble in aqueous medium to produce nanofibrillar self-assemblies. Under appropriate conditions, these self-assemblies can impede the flow of water to produce hydrogels. We have employed these self-assemblies and hydrogels as novel drug delivery systems, chiral templates for materials synthesis and as stimuli responsive materials. My talk will summarize the exciting opportunities offered by the amino acid-derived soft biomaterials and our contribution in this field. The structural requirements to produce aesthetic materials will be also emphasized.

References:
Invited Talk 6

Black (nano)Gold as Artificial Trees to Fight Global Warming

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Abstract:
Global warming is a serious threat to the planet and the living beings. One of the main cause of global warming is the increase in the atmospheric CO₂ level. The main source of this CO₂ is from the burning of fossil fuels in our daily lives. By using the techniques of nanotechnology, we have transformed yellow gold to black gold, by changing the size and gaps between gold nanoparticles. We achieved this by the concept of plasmonic coupling. Black gold absorbs light over the entire visible region as well as in the near-infrared region of the solar spectrum. Notably, black gold generates a large number of “hotspots” which can be used for CO₂ methanation reaction. Similar to the real trees, which uses CO₂, sunlight, and water to produce food, the developed black gold acts like an artificial tree that uses CO₂, sunlight and water to produce fuel (which can be ideally used to run our cars). Notably, black gold can also be used to convert seawater into drinkable water using the heat that black gold generates after it captures sunlight. This work is a way forward to develop “Artificial Trees,” which capture and convert CO₂ to fuel and useful chemicals. Although at this stage, the production rate of fuel is low, in coming years, we may be able to convert CO₂ to fuel using sunlight at atmospheric condition, at a commercially viable scale, possibly using less expensive metal and CO₂ may then become our main source of clean energy. I will discuss these results in my talk.

References:
Invited Talk 7

Glycopolymeric hydrogels for drug delivery and biosensing applications

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Abstract:
Carbohydrates remain one of the main chiral pools for the synthesis of materials/molecules for various tailor made applications especially in bio-medical field. The present discussion will be based on the application of azide derivatives of D-glucose for the synthesis of glycoacrylamides, precursors for glycopolymers useful for drug delivery, and sensing applications. The ability of sugar pendants on glycopolymers to mimic that on cell surface can be used as a reliable method for the site specific delivery of drugs. In the search of new possibilities two glycoacrylamides were synthesized and was transformed to glycopolymeric gel through radiation induced method; a green strategy. These gels were utilized for sustained and targeted delivery of anticancer drug, doxorubicin (DOX). The aggregation induced emission (AIE) properties of glycoacrylamides in water were studied for biosensing applications like lectin recognition and bacterial detection. The glycoacrylamide stabilized gold nanoparticle-system, for “turn on” mode of biosensing will also be discussed.
Invited Talk 8

Rare-earth doped phosphors for light emitting display, light harvesting and biological applications

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Abstract:

We have prepared various semiconducting nanomaterials such as SnO₂, ZnO, APO₄ (A = Y, La, Gd), AVO₄, CaMoO₄ and PbSe using co-precipitation methods. These materials can absorb light in UV, visible or NIR or IR region. Depending on size of particles, absorption band can be changed. For example, PbSe quantum dots (QDs) can change its absorption band from 600 nm to 3000 nm due to strong quantum confinement possessed by the material. After absorption of sufficient energy, it can produce the electron-hole recombination leading to emission in visible-NIR region. Most semiconducting nanoparticles have large absorption cross sections and their emission bands are also broad. However, lanthanide ions (Ln³⁺) show very low absorption cross-section, but their absorption and emission transitions are sharp due to f-f transitions. When a few percentages of Ln³⁺ ions are doped in the host semiconductors, there is a possibility for energy transfer from host to Ln³⁺ and thus enhanced emission intensities of Ln³⁺ occurs. In view of this, we have prepared Ln³⁺ doped semiconducting materials, which are able to show emission in visible as well as NIR range. Also, UV and visible emission can be produced by absorption of NIR light through Up-conversion process. NaYF₄: Ln³⁺ Up conversion nanoparticles have been prepared and investigated their emission properties using 980 nm CW laser. The bio-imaging properties using lanthanide doped semiconductors were investigated in different cell-lines. In addition, optical display, temperature sensing, light harvesting, photothermal therapy and optical switching were investaged using various nanoparticles. Using persistent luminescence nanoparticles, the distribution of nanoparticles in the different organs of mice can be traced for about 2 hours and this study will help in alternative way to radio-isotopes based diagnosis.

References:

5. Applied Catalysis B: Environmental, 221,2018, 443.
Invited Talk 9

Production of Biodiesel by Transesterification of Renewable Materials

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Abstract:

Alternative fuels and energy sources are an issue of increasing importance - not only among the scientific and engineering community, but also in economics and public policy. It provides an excellent opportunity of interdisciplinary research.

Biodiesel is an alternative diesel fuel that is produced from vegetable oils and animal fats. Biodiesel can be produced through "transesterification"; a process that combines vegetable oils and animal fats, with alcohol in the presence of a catalyst to form fatty esters. Biodiesel is defined as the mono-alkyl esters of fatty acids derived from vegetable oils or animal fats. When made from methanol it’s called Methyl Esters, when made from Ethanol it’s called ethyl esters.

Biodiesel meets health effect testing, has lower emissions, high flash point (>300F) making it a safer fuel. It is biodegradable, essentially non-toxic.

Transesterification is a process of displacement of an alcohol group from an ester by another alcohol. There are three basic routes to biodiesel production from oils and fats:

1) Base catalyzed transesterification of the oil.
2) Direct acid catalyzed transesterification of the oil.
3) Conversion of the oil to its fatty acids and then to biodiesel.

The transesterification using excess of alcohol is quite successful to manufacture biodiesel completely. The amount of alcohol used can be reduced by conducting the reaction in steps, where part of the alcohol and catalyst are added at the start of each step, and the glycerol is removed at the end of each step. Besides methanol, other alcohols can be used including Ethanol, Propanol, Isopropanol, Butanol. Water and free fatty acids inhibit the reaction. Higher alcohols are particularly sensitive to water contamination.

Blends of 20% biodiesel with 80% petroleum diesel can be used in unmodified diesel engines. It reduces the emission of harmful pollutants (mainly particulates) from diesel engines but emissions of nitrogen oxides are increased. It can be used in unmodified diesel engines. Biodiesel burns with pleasant smell of Pop-corn or potato wafers. It reduces green house gas effect.

Some challenges related to Biodiesel include – operation in cold weather, producing enough feedstock oil to replace a large portion of petroleum, optimization engine and emissions.
OP-1

Ways to Waste Management
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Abstract:
Charity begins at home is a basic principle accepted world over, so in the matter of waste management, the policy holds good and the management of household waste is discussed in this paper with methods and proper solution.

Household waste can range from something as harmless as any garbage, paper, wrappings, cardboards, cans, wood scraps, and loose glass in any form to something that can turn out to be harmful if not disposed properly and therefore is hazardous. A commonly seen practice that has harmed and which continues to harm our environment is illegal dumping of both hazardous and non-hazardous wastes simply to avoid the time and effort required for proper disposal. When it comes to household wastes, much of the effort has been reduced with the help of corporation staff that collects the waste door to door. However much still can be done and needs to be done as illegal dumping creates a public nuisance and harms the environment, especially when some of it can be productively used.

The best way to manage waste is to contain it at its very roots, that is to avoid it and if it occurs to minimize it. Some of the wastes that a household sees and fails to think of it as waste are the mundane paper bills, ads, paper mailings and utility bills. These items if paid attention to can be reduced significantly instead of allowing them to accumulate and be a part of the problem that can be avoided.

Keywords: Hazardous, Mundane, Landfill, Organic waste, Ecosystem

OP-2

Investigation of Volumetric, Acoustic and Optical Properties of Aqueous Binary Mixtures of 2-Isopropoxy ethanol at T = (278.15 and 288.15) K

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Abstract:
The densities (ρ), speeds of sound (u) and refractive indices (nD) of aqueous binary mixtures of 2-Isopropoxyethanol or ethylene glycol isopropyl ether (EGIPE) have been measured. Study of Water + Glycol Ether system was done over entire concentration range, at two different temperatures i.e. T/K =
(278.15 and 288.15) and at an ambient pressure. The obtained results were used to calculate different derived parameters such as apparent molar volumes ($\phi_v$) of solute, excess molar volume ($\nu^e$) of solution, isentropic compressibility ($\beta_s$) of the solution, apparent molar isentropic compressibility ($\phi_{\beta_s}$) of the solute, and apparent molar refraction ($\{R\}_1, 2$) of the solution. The limiting apparent molar volume of solutes ($\phi_v^0$), limiting excess partial molar volumes ($\nu_2^{e,m}$) and limiting apparent molar isentropic compressibility of solute ($\phi_{\beta_s}^0$) have been obtained at these temperatures. The obtained results of different derived parameters has been compared with our previously reported literature data at $T/K = 298.15$. The values of excess molar volume ($\nu^e$) of the solution were fitted in Redlich–Kister polynomial equation to obtain the coefficients of regression. The values of apparent molar refraction ($\{R\}_1, 2$) of the solution were linearly fitted. The results obtained the present work have been interpreted in terms of different molecular interactions among solute and solvent moieties such as hydrogen bonding, solute–solute and solute–solvent interactions.

**Keywords:** excess molar volume, apparent molar isentropic compressibility, apparent molar refraction, Redlich–Kister polynomial equation, solute-solvent interactions, solute-solute interactions.

*Presenting author

**References:**

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**OP-3**

**Synthesis, Electrical and Dielectric Properties of Polyaniline-Copper Sulfide Nanocomposite**

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**Abstract:**
Polyaniline transition metal salt composites are significantly attractive due to their attractive physical properties. Polyaniline/copper sulfide nanocomposites were synthesized via oxidizing aniline with the nickel sulfide complex. Adequate proportion of metal nanoparticles with conductive polymers can result unique physical and chemical properties that can be used in multidimensional areas. In this work effect of copper sulfide nanoparticles on the electrical conductivity and dielectric properties of polyaniline were discussed. The product was characterized through FT-IR, NMR and TEM spectroscopy. TEM study showed that the copper sulfide has been successfully incorporated and uniformly dispersed into the polymer matrix. Shift in peak at higher wavenumber in FTIR spectra indicates the interaction of CuS nanoparticles with PANI. Appreciable increase in the electrical conductivity of PANI/CuS nanocomposite can be widely used in multifunctional electronic devices.

**Keywords:** Polyaniline, Copper sulfide, Nanocomposites, Electrical Properties

**References :**

OP-4

Natural Product Based Alkyd Resin For Water Thinnable Coatings

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Abstract:
The interest in improvement of waterborne paints lately increased due to the toxicological effect of certain ingredients of paint on human health, environment and the escalation in prices of petroleum based raw materials. Alkyd resin is one of the most common types of binder in the paint and coating industry, prepared from the reagents such as petroleum products, phthalic unhydrides and organic solvents. However, the excessive use of these reagents harms the environment. In this event, the concerned industries are trying to replace these hazardous chemicals with alternative resources which are of vegetative nature. In the present paper we have attempted vegetable oils, herbs, plant extracts as alternative substitutes for petroleum products. The main intention of using these substitutes in the synthesis of products is as they are primarily nonhazardous and degradable in nature. We have prepared alkyd resin with less than 15% of petroleum ingredients and 80-90% renewable plant products like castor oil, rosin, etc. Then it has been thoroughly analyzed for its physicochemical and spectroscopic properties. Alkyd resin with desirable properties has further been used for the formulation of water thinnable paints. In the composition of paints, we have been successfully replaced maximum amount of organic solvents with water without sacrificing technical performance of the final products. All paint samples have been analyzed for their physicochemical and film properties. Further, the properties of these samples have been compared with the commercial sample which shows good to excellent results. Here our main focus on use of less organic solvents and petroleum based raw material. Hence we can conclude that the present research on water thinnable paints is a feasible composition which is technically sound, economic and environment friendly with more emphasis on low volatile organic compounds (VOCs) emission.

Keywords: Alkyd resin, water thinnable paints, castor oil, rosin, volatile organic compounds.
**OP-5**

Dihydropyrimidinone Derivatives: A Glimpse at the Synthesis and Exploration of their Pharmacological Efficiency

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Abstract:
The dihydropyrimidinone (DHPM) scaffold has been attracting the interest of a large number of chemists over the years owing to its expanded pharmacological profile1-3. In recent years, interest has also been focused on the synthesis of analogs of dihydropyrimidines such as the aza-analogs which depict a very similar pharmacological profile. However, since a single molecule remains insufficient to study the structure activity relationship; the dihydropyrimidinone scaffold is being studied extensively so as to expand the existing structure activity relationships and to get further insight into molecular interactions at the receptor level. This framework thus represents an interesting template for combinatorial and medicinal chemistry. The alteration at the C-5 side group is a step into embellishing these DHPMs from the pharmacological point of view.

Keeping this in mind; herein, we report synthesis of derivatives of dihydropyrimidinone as hybrid molecules. Accordingly, all the synthesized compounds were characterized by FTIR, NMR and Mass spectrometry. The synthesized compounds were screened for their anti-inflammatory, anthelmintic and anti-bacterial activity. The screening data suggests that the compounds display interesting pharmacological efficacy.

**Keywords:** Dihydropyrimidinone, anti-inflammatory, anthelmintic and anti-bacterial activity

References:

**OP-6**

Thermodynamic and kinetic studies of Cyanide adsorption on acid activated Red Mud

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Abstract:
Red Mud (RM) is a waste byproduct of Bayer’s process for alumina production. Due to its alkaline nature and complexity of the composition it is environmentally very hazardous for mankind and ecosystem. In the present investigation first raw red mud (RM) and acid activated red mud (RMA) are characterized using chemical analysis and physical methods like BET surface area, X-ray diffraction, scanning electron
microscopy (SEM) and particle size analysis. Then surface assimilation of Cyanide having initial concentration range of 10-300 mg/L by RM and RMA which primarily rely upon parameters like pH, adsorbent dose, cyanide concentration, different temperature and contact time was studied. During this investigation, surface assimilation capacities at pH of 7 are found to be 5.396 mg/g for RMA whereas 1.85 mg/g for RM. Various adsorption isotherm models including Freundlich, Langmuir (I to V), Elovich are studied as per the suitability of the adsorption process and it has been found that the Langmuir-II isotherm fits well with the obtained experimental information as compared to other isotherms. Three dynamics models specifically, the first order; second order and intra-particle diffusion were also analyzed for experimental information. Among them, the data is found to be the most effectively fitted to second order kinetic model. Thermodynamic parameters like Gibbs free energy, entropy change and enthalpy change have also been calculated.

Keywords: Red Mud, Acid Treatment, Waste Utilization, Adsorption, Environmental Hazards.

References:

OP-7

Synthesis of Biodegradable Plastics from Temple Waste Produced in India and Study their Swelling Kinetics

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Abstract:
Bio-degradable plastics were synthesized from temple waste (Nirmalya) generated in India such as Grass (Durva), Marigold, Rose, Basil (Tulsi), Chrysanthemum, Bel leaves and Mixture of temple waste (Nirmalya) with Starch, Acetic acid, Glycerin. Swelling test in water with different time intervals was conducted at 25°C temperature. To investigate the swelling properties of the synthesized bio-degradable plastics, the first order Fick's model and second order Schott's absorption kinetic equation models have been applied. Analysis emphasized that; the models which applied to data were good agreement with the experimental data. Results have shown that water-absorbing behaviour of bio-degradable-plastics as swelling increases with time.

Keywords: Biodegradable plastic, Fick's model, Schott's model, Swelling Kinetics, Temple Waste
*Presenting author
Study Of Volumetric Properties Of L-Ascorbic Acid In Dilute Aqueous Solutions at T = (303.15, 308.15 And 313.15 ) K.
Prachi N. Dahasahasra

Abstract:
Fundamental thermodynamic properties are very useful for understanding various interactions (solute-solute and solute-solvent) occurring in solution. Study reports systematic measurements of density ($\rho$) of aqueous binary mixtures of L-Ascorbic acid in the concentration range (0.01 - 0.1) mol. kg$^{-1}$ at three different temperatures. All the measurements of density ($\rho$) were done on Anton Paar DSA 5000M and data was used to calculate the various derived parameters such as apparent molar volume of solute ($V_\phi$), limiting apparent molar volume of solute ($V_\phi^0$), second derivative of limiting apparent molar volume of solute ($\partial^2 V_\phi^0 / \partial T^2$), limiting apparent molar expansivity of solute ($E_\phi^0$) and thermal expansion coefficient ($\alpha^*$). The results have been discussed in terms of various molecular interactions taking place between L-Ascorbic acid and water.
Keywords: Density, L-Ascorbic Acid, Apparent molar volume

3D Architectured Poly(acrylamide-co-azomethine-co-acrylic acid) cogel:
Synthesis, characterization and Salinity Profile
Nandkishor B. Shirsath$^1$, Devendra S. Raghuvanshi$^2$, Jyotsna S. Meshram$^3$

Abstract:
Here in this innovative work Poly(acrylamide-co-azomethine-co-acrylic acid) hydrogels were prepared in water as green solvent in order to study the effect of acrylamide content on swelling behaviour of hydrogels. It was found that hydrogels prepared in solution exhibited the highest swelling. The results also indicated that the stability of azomethine is increased by formation of cogel with poly(acrylamide-co-acrylic acid). In this report, straight forward and efficient synthetic protocol for cogel formation responded without any environmental hazard. The hydrogels were also characterized by Fourier transform infrared, elemental analysis, differential scanning calorimetry, thermal gravimetric analysis and field emission scanning electron microscopy. Swelling capacity of P(AM-co-AA) and cogel was studied by addition of different saline solutions including monovalent, divalent, and trivalent salts. Its applications can be extended in agricultural industries as a basis for super absorbent polymer, waste water treatment,
and even in medical field. Hence, the synthesized materials can be biodegradable, environment-friendly, and biocompatible inspired by the green chemistry concept.

**Keywords:** Poly(acrylamide-co-azomethine-co-acrylic acid), swelling behaviour, agriculture, green chemistry

**References:**

**Abstract:**
Today’s scenario is dominated by many smart materials. Of them all polymers play a major role. Polyvinyl chloride (PVC) is the third most widely used polymer for various applications. In the present study it is intended to explore stability of the polymeric powder against gamma-radiation. Various parameters like viscosity, density of the polymeric solutions as a function of concentration as well as absorbed dose are investigated. Some spectroscopic studies such as infra-red and UV-visible spectroscopy were also carried out to have an insight of the changes taking place at molecular levels.

**Keywords:** Polyvinyl chloride (PVC), gamma-radiation, infra-red spectroscopy, UV-visible spectroscopy

*Presenting author

**References:**
5. R. Sharma Jha, R. Bajpai, Effect of gamma irradiation on polyvinyl chloride, polymethyl methacrylate and their polymer blends, International research journal of engineering and technology (IRJET), 3(9), 2016, 1594-1598.
Thermodynamic Stability Analysis of Consecutive Chemical Reaction Using Lyapunov Function Analysis
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Abstract:
Consecutive Chemical reactions are one of the important example of Composite reactions which follows Complex mechanism. In Consecutive chemical reactions, there is formation of intermediate which further undergoes reaction to form intermediate and so on. The complexities of these reactions may be reduced by, such as, Bodenstein steady state approximation. Therefore in this paper, the thermodynamic stability of Consecutive chemical reaction has been investigated by perturbing the mole number of intermediate species under two different kinetics situations of Bodenstein steady state approximation, namely, vант’s Hoff intermediate and Arrhenius intermediate using Lyapunov function constructed using rates of entropy production on real and perturbed trajectories, following the Lyapunov’s (direct) second method stability of motion. Various stability region have been discuss for intermediate steps of Consecutive chemical reactions.

Keywords: Consecutive chemical reactions; Bodenstein Steady state; Lyapunov function; thermodynamic stability;
Presenting Author: *Seema G. Rawat

References :
Eco-friendly barite SrCrO₄ nanocatalyst for the degradation of organic pollutants using Visible Light

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Abstract:
The environmental contaminants and energy crisis are global issues of concern. Increased urbanization and high living standards burden the environmental health. These challenges require efficient and low cost technique. The efficient and promising technique for the degradation of organic pollutants is photocatalytic degradation by using clean sustainable solar energy. Photocatalysis is a green technology for the treatment of all kinds of contaminants, particularly organic compounds which mainly involves oxidative decomposition of organic compounds and purification of waste water. The heterogeneous semiconductor photocatalysis is the reaction based on the hole and electron pair, which is generated on the semiconductor by irradiation of visible light of energy equal to or greater than band gap. This photoexcited electron and hole pair provides redox reaction which can be mineralised organic pollutants and production of O₂ and H₂ from water. We explore catalytic activity of SrCrO₄ nanoparticles as an ecofriendly and efficient catalyst in the degradation of methylene blue as reference pollutant under visible light irradiation about wavelength range 655-660 nm. Strontium Chromate prepared by three different methods under variety of conditions for applications point of view. The degradation was monitored by measuring change in concentration of substrate as a function irradiation time using spectrophotometric analysis. The degradation of methylene blue was studied using different parameters such as type of photocatalyst, catalyst and substrate concentration. The degradation rate was found to be strongly influenced by all above parameters. In the present work, we will discuss the design and use of SrCrO₄ for the degradation of methylene blue under visible light irradiation and SrCrO₄ prepared by ultrasonic method was found to be more efficient as compare to sol-gel and solid state methods.

Temporal Spectral Changes during photocatalytic degradation of Methylene Blue in Presence of SrCrO₄ by Ultra sonic method.

Keywords: Photocatalyst; Methylene blue; Strontium Chromate
Effective Cr (IV) ions Removal Studies on Zirconia crosslinked Chitosan composite

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Abstract:

Chitosan and its modified composites have wide application in waste-water treatment. Its demand is based on the facts that its modified materials are environment-friendly, non-toxic and biodegradable. The present work reports Zr(IV) crosslinked chitosan for the removal of Chromate ions from aqueous solution. It was characterized and studied by FT-IR spectroscopy, elemental analysis, TGA analysis and the surface morphology was examined by scanning electron microscopy. The pH point of zero charge of prepared adsorbent was found to be 5.7. Maximum efficiency of the adsorbent was observed at pH 4.0. FT-IR data shown that, there is an electrostatic interaction of metal ion with primary –NH₂ and –OH groups of Zr(IV)-chitosan. Batch adsorption parameters like pH, contact time, initial concentrations, amount of adsorbent, temperature, were optimized. Under these conditions, Zr-CTS was found to have a reportable adsorption capacity and the experimental data fitted to Freundlich adsorption isotherm and followed pseudo-second order kinetics. Thermodynamics parameters confirmed that the process of adsorption was spontaneous, exothermic and leading to increase in entropy. The used material was regenerated using 5% NaCl solution and could be reused in multiple cycles adding greener dimension. The material was also tested by tea-bag model studies.

Keywords: hexavalent Chromium, Zr(IV)-Chitosan composite, adsorption, adsorption isotherms, kinetics

References:
OP-14
Iron Removal from Aqueous Solution by Using Moringa Oleifera Seed Pod Husk Activated Carbon as an Adsorbent.
Varada V. Khati
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Abstract:
Iron from contaminated water Moringa oleifera seed pod husk Activated Carbon was utilized as an adsorbent to remove Iron from aqueous solutions. The effect of pH, adsorbent dosage, initial concentrations, contact time, and temperature were studied using batch adsorption experiments. Characterization of adsorbent was identified by FTIR and XRD techniques. The pH dependence study of the adsorption process revealed that maximum pH for Iron removal was 8 with removal of 88.73%. Temperature study reveals that the adsorption is endothermic as efficiency increases with the increase in temperature. The adsorption of Iron on Moringa oleifera seed pod husk activated carbon shows that the removal efficiency increases with increase in contact time and also increased as adsorbent dosage increases from 0.5gm/50ml to 2.5gm/50ml. The study showed that the method is a simple and efficient one to remove Iron from the aqueous solution.

Keywords: Activated carbon, adsorption, batch adsorption experiments, Moringa Oleifera seed pod husk, Iron removal

References:

OP-15
Chitosan Stabilised Metal Nanoparticles For Photocatalytic Hydrogen Generation
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Abstract:
Metal nanoparticles stabilized by polymers is emerging as a new class of materials having entirely new physico-chemical properties as that of bulk and atom both. Stabilizers play important role in protecting the nanoparticles and also contributes in improvising the overall surface area. Chitosan, a natural polymer is selected as a stabilizer for the synthesis of iron nanoparticles. These nanoparticles are thoroughly characterized by using BET-surface area, FTIR, TEM and XPS. TEM images are showing well dispersed nanofibers with average size of 13nm. XPS data supports the formation of Fe2O3 type
structure with O1s binding energy at 529 eV and Fe 2p binding energy at 710 eV. BET Surface area value is 36.7283 m²/g with pore size of 145.1610 and pore volume of 0.133288 cm³/g. This synthesized nanomaterial was evaluated for photocatalytic hydrogen generation via water splitting reaction. Iron nanoparticles are showing good photocatalytic activity with hydrogen evolution rate of 2607.5 μmoles h⁻¹ g⁻¹ of photocatalyst. The nanoparticles are magnetically retrievable and hence can be separated effectively from heterogeneous system.

Fig.1 TEM image of chitosan stabilized iron nanoparticles.

Keywords: metal nanoparticles; photocatalysis; hydrogen generation; water splitting

References

Multiparameter Models Of Adsorption Isotherms With Of Phenol And O-Cresol Adsorption On GAC

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Abstract: The adsorption isotherms of Phenol and o-cresol from aqueous solution on to Granular Activated Carbon (GAC) were studied and modelled for multiparameter of adsorption isotherms. The best fit isotherm, and the experimental equilibrium data has been determined and analysed using isotherm models with more than two-parameter isotherms; Three-parameter isotherms; four parameters isotherms and five parameter isotherms. The results were further analysed to get the best fitted adsorption isotherm model to the experimental data. The order of their fitment has also been discussed in details in order to understand the
adsorption phenomena in depth. The adsorbate analyses have been carried out using UV -Vis spectrophotometer.

**Keywords**: Adsorption, Activated Carbon, Cresol, Modelling

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**OP-17**

**Synthesis, Characterization of Polyesteramide Resin From Rice Bran Oil**

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**Abstract**:  
The utilization of plant oil renewable resources as raw materials for monomers and polymers is reviewed. In an age of increasing oil prices, global warming and other environmental problems (e.g. waste) the change from fossil feedstock to renewable resources can considerably contribute to a sustainable development in the future. Especially plant derived fats and oils bear a large potential for the substitution of currently used petrochemicals, since monomers, fine chemicals and polymers can be derived from these resources in a straightforward fashion. The synthesis of monomers as well as polymers from plant fats and oils has already found some industrial application and recent developments in this field offer promising new opportunities. Considering this facts, we used rice bran oil in the preparation of polymeric material.

In the present study, Fatty amide and polyesteramide resin were successfully synthesized from rice bran oil. The fatty amide was obtained from rice bran oil by treatment with diethanol amine. Further this N-N-bis (2-hydroxy ethyl) rice bran oil fattyamide through condensation polymerization with adipic acid and prepared polyesteramide resin. The synthesized fatty amide and polyesteramide resin has been characterized by FT-IR, 1H-NMR spectroscopic analysis. Also studies the physicochemical properties like acid value, hydroxyl value, saponification value etc.

**Keywards**: Rice bran Oil, fatty amide and polyester-amide resin

*Mamata T. Sangole*
Degradation Kinetics of P-Aminobenzoic Acid By Peroxidation, Photo-Peroxidation And Photofenton Processes In Water

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*Presenting author : * Susmita A. Mandavgane

Abstract:
In the present work p-amino benzoic acid in its aqueous solution was treated by peroxidation (H₂O₂) and photo peroxidation (UV/H₂O₂) and photofenton (UV/Fe²⁺/H₂O₂) processes. The experiments were taken out in a batch photoreactor using 8W low pressure mercury vapor lamp to examine the effects of different combinations and their degradation rates are compared. Substrate concentration was fixed by utilizing a UV-Visible spectrophotometer. The results indicated that the rate of degradation follows the following sequence; photofenton > photoperoxidation > peroxidation. The photo degradation processes were adhered to first order dynamics.

Keywords: p-amino benzoic acid, peroxidation, photo-peroxidation, photofenton, first order dynamics.

References:
240nm. The retention time under optimized condition of Rosuvastatin calcium and Fenofibrate was found to be 2.485 & 3.905 minutes respectively.

The developed method was validated as per ICH guideline for specificity, linearity, accuracy, and precision and system suitability. The new RP-HPLC method was successfully applied to marketed formulation without any interference from excipients.

**Keywords:** Rosuvastatin calcium, Fenofibrate, ortho phosphoric acid, RP-HPLC, validation.

**References (If any):**

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**OP-20**

**Conductometric Analysis of Substituted Flavones with Variability of Temperature**

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*Presenting author : *Dr.S.L.Sayre

**Abstract:**
Electrical conductivity has been measured in practice for more than 100 years and it is still an important and widely used analytical parameter today. The high reliability, sensitivity, fast response, and the relatively low cost of the equipment make conductivity a valuable, easy-to-use tool for quality control. In recent years, scientists have turned to various flavonoids to explain some of the health benefits associated with diet rich in fruits and vegetables. Flavone one of the important part of it ,which includes good antioxidant, anticancer properties that can studied different physic-chemical processes, conductometry also help to show ionic interactions in molecules.

Taking all these things into consideration the present investigation was carried out in various percentage compositions and at different temperatures for substituted flavones (L1 to L6). The conductance measurements of 0.01 M solution of flavones and its derivatives thus synthesized have been carried out in different percentage of ethanol-water mixture, at varying temperature conductance of electrolyte in the solution gives outstanding information about the solubility and inter-ionic interaction. Observed conductance, specific conductance, equivalent conductance determined by conductometric technique which help to understand the molecular interactions, ion-solvent interactions, types of ions, ionic mobility ,effect of different percentage composition and temperature.

**Keywords:** conductometry, flavones, specific conductance, equivalence conductance.
Scorch Aide Synthesis of Novel Imine Schiff bases from DNP, SCA, AHSA and its Derivatives

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Abstract:
In recent study for Scorch Aide treatment to compound by conventional method such as thermostat. The synthesis of novel Schiff bases are imine derivative are generalized as R₁CH=NR₂. Schiff base are condensed from aldehyde and amines such as R₁ is Veratraldehyde, 3-Nitrobenzaldehyde, Anisaldehyde, Furfuraldehyde and Salicylaldehyde. R₂ such as 2, 4-Dinitrophenylhydrazine (DNP), Semicarbazide (SCA) and 4-Amino-3-Hydroxynapthalene-1-Sulphonic acid (AHSA). Each subsequent reaction into three schemes of amines and substituted aldehydes in ethanol through condensation reaction followed by thermal heating in optimization of time and solvent. All These Schiff base compounds are characterized and identified by UV Visible, FTIR, ¹H NMR and Mass spectroscopy.

Keywords: Schiff base, Amines, Aldehydes, Condensation Reaction, DNP, SCA, AHSA, Spectroscopy.

References:

Apparent Molar Volume and Compressibilities Studies of Citrulline in Aqueous solutions at T= (288.15-318.15) K.

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*Presenting author : *Nikhat Sheikh

Abstract:
Citrulline is a non-essential amino acid. In hepatocytes L-citrulline is synthesized in the urea cycle by the addition of carbon dioxide and ammonia to ornithine. Density (ρ) and ultrasonic velocity (u) values of Citrulline in aqueous solution have been measured at T = (288.15, 293.15, 298.15, 303.15, 308.15, 313.15 and 318.15) K within the concentration range of (0.02 to 0.2) mol·kg⁻¹. These measurements have been performed to evaluate some important parameters, viz, apparent molar volume of solute (Vϕ),
limiting apparent molar volume of solute \( \left( V^0_\phi \right) \), limiting apparent molar volume of transfer \( \left( \Delta_n V^0_\phi \right) \), limiting apparent molar expansivity \( \left( E^0_\phi \right) \), thermal expansion coefficient \( \left( \alpha^* \right) \), second derivative of limiting apparent molar volume \( \left( \partial^2 V^0_\phi / \partial T^2 \right) \), apparent molar compressibility \( \left( \kappa^0_\phi \right) \), limiting apparent molar compressibility \( \left( \kappa^0_{\phi} \right) \), partial molar isentropic compressibility of transfer \( \left( \Delta_n \kappa^0_\phi \right) \) and hydration number \( \left( \eta_H \right) \) have been calculated.

**Keywords:** Apparent molar volume, citrulline, isentropic compressibility

**References:**

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### OP-23

**Baker’s Yeast catalysed Knoevenagel condensation reaction of Aromatic aldehyde with malononitrile under non-aqueous media**

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**Abstract:**
Baker’s yeast (BY) efficient catalyst for organic transformation.\(^1\) Ability of catalyst we develop green protocol for Knoevenagel condensation reaction of benzaldehyde with malononitrile in nonaqueous solvent. Reaction in this reaction malononitrile contain highly active methylene group therefore selected for this reaction.\(^2,3\) Different derivatives of benzaldehyde used for this reaction. Synthesize product will be confirmed by using spectral analysis.

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\begin{array}{c}
\text{Benzaldehyde} \quad \text{Malononitrile} \\
\text{ \quad} \text{2-benzylidenemalononitrile}
\end{array}
\]

**Keywords:** Baker’s yeast, Knoevenagel, Condensation, Malononitrile

**References**
OP-24

Intermolecular Interactions of Some Amino Acids in Aqueous Medium: Volumetric, and Compressibility Studies

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*Presenting author: Rojo John

Abstract:
The determination of the factors governing the conformational stability of biopolymers is of fundamental importance for many biological phenomena. The study of the solute-solvent and solute-solute interactions is of primary importance in the maintenance of native conformation of proteins and nucleic acids. We report herein the densities, ρ, ultrasonic speed, u of L-arginine hydrochloride and L-proline in aqueous solvent in the temperature range of 288.15–318.15 K at an interval of 5 K and at atmospheric pressure. Densities and speeds of sound have been used to calculate apparent molar volume of solute, partial molar volume, partial molar volume of transfer, thermal expansion coefficient, limiting apparent molar expansibility, isentropic compressibility of solution, apparent molar isentropic compressibility of solute, limiting apparent molar isentropic compressibility of the solute, apparent molar isentropic compressibility of transfer. The results have been discussed in terms of various interactions prevailing in aqueous solutions of amino acids in sodium chloride/urea solutions.

Keywords: Density, Speed of sound, L-Proline, L-Arginine Hydrochloride, Sodium chloride, Urea.

References:

OP-25

Effect of carbon nanofiber content on thermal conductivity and EMI shielding efficiency of highly flexible ethylene methyl acrylate nanocomposites

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Abstract:
Carbon nanofiber filled ethylene methyl acrylate copolymer (EMA) composites were fabricated by simple solution mixing strategy followed by roll-milling to achieve good thermal conductivity and efficient electromagnetic shielding effectiveness (EMI SE) in the X-band frequency range (8.2-12.4 GHz). The morphological investigations show the proper dispersion with good interfacial adhesion and compatibility of CNFs in EMA matrix which lead to noticeable improvement of thermal, electrical, and EMI SE performance. The structural distributions of CNFs and polymer-filler interactions were also examined.
The EMI shielding efficiency of the composites was further investigated with thickness and bend-flexing (bending cycles) which implicate the practical utility. The deformation treatments led to a little change in conductivity due to the disturbance of conducting network structure. The promising low percolation threshold value (5.5 wt%) is attributed to superior EMI SE value of 45 dB at 18 wt% CNF loading with potential of absorption dominance in measured frequency region. Our trust stands in the promotion of scalable production of flexible EMA/CNF nanocomposites of superior EMI shielding efficiency to eliminate electromagnetic pollutions.

**Keywords:** Electromagnetic interference shielding; ethylene methyl acrylate copolymer; carbon nanofiber; electrical property; thermal conductivity.

*Presenting author

**References**


**OP-26**

**Design, Synthesis, Characterization and Biological Activities of Recent Isatin Derivatives with Proven Pharmacophoric Moiety**

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**Abstract:**

Derivatives of Isatin (1-H-indole-2,3-dione) possess a versatile bioactivity [1] and is used as starting compound for synthesizing a wide range of heterocyclic compounds in drugs preparation [2]. The past studies on isatin derivatives are found to possess antitumor, antibacterial, antifungal, anti-HIV, anticonvulsant, antiviral, anti-inflammatory, and many more other biodynamic properties [3]. Drugs containing the isatin skeleton are used to treat diseases such as epilepsy, tuberculosis, and bulimia. Considering the precedential biological properties of Isatin and its derivatives, there is further scope to create and explore Isatin derivatives for emerging drug-targets. New substances based on proven Isatin scaffolds in combination with other pharmacophoric elements of drugs can be a right approach for the synthesis of new Isatin derivatives for prospective drugs. Considering the fact that N-Alkylated Isatin derivatives which possess anticancer activity [4], N-alkylated Isatin derivatives along with other proven pharmacophoric moieties such as ethyl pyrrolidine, ethyl piperdine di-methyl amino ethane and diethyl amino ethane were used to create new Isatin derivatives and investigated for various biodynamic activities such as antitumor, antibacterial and antifungal activities. Further, a new set of Isatin derivatives by imine formation at C3 of alkylated compounds were prepared and screened for biodynamic activities.

**Keywords:** Isatin, Schiff base, Cancer cell-lines, Anti-tumor activity, Anti-fungal activity, Anti-bacterial activity

**References :**
Study on Plastic Waste Composition, its Impact And Output into an Utilizable Material

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Abstract:
This paper introduced about the recent issues, process and applications on plastic waste. Increase in production of plastic waste due to development, societies constantly facing plastic solid waste pollution problem and finding opportunities of their sustainability awareness and technological advances. Conservation of natural resources and prohibition of environment is the essence of any evolution. Plastic waste production and utilization in proper way is need of any research. In research work investigation and identification of composition of scrap carried out to and it has been observed that it consists of mixer of polyolefins like PVC, PP, PS, HDPE, LDPE, PET etc. Due to non-degradable property and improper management plastic waste is a big issue from different processes it is concluded that plastic recycling is one of the best methods for plastic waste management. Plastic waste promotes due to vast industrialization and technological development. While recycling stonedust was blended with a scrap with a binder to get a new product by means of twin screw extruded and injection moulding machine. Recycling and convert it into applicable product is the aspect of research work. From the study of new materials properties from different paper published the applicable product has better strength, durability from all mechanical and rheological properties measured. And it is concluded that the investigated that new material can be designed by using different moulding techniques into an useful fields materials like construction, agriculture, household and the better way for global protection.

Keywords: Recycled, PET, LDPE, HDPE, Moulding
Ecofriendly lead free emulsion paint

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Abstract:
Alkyd emulsion pastes with low acid value and high % solid (50%) were to be prepared. These alkyd emulsion pastes have been used in formulation of synthetic emulsion paint. The proportion of emulsion paste binder is 10 to 25 % to get the desirable characteristics of paints. The emulsion paints is compared against commercial paint for the viewpoint of technical and economic viability. Normally we are required to add 1% of cobalt and 2 % lead as drier in many compositions. As we are thinking of preparing ecofriendly lead free paint this small amount of drier should be avoided in final paint. In present formulation, we do not use any drier for any lead composition yet we are getting excellent drying and hardness property.

Keywords: Short oil alkyd, Novel resin, synthetic emulsion paint

Presenting Author: Dr. S. P. Dhopte

High performance Electrode Using Conductive ITO Thin Film Based on Wrinkle Structure Elastomer

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Abstract:
Traditional metallic and semiconducting electrode only withstand very limited stretchability1. Typically, they are not suitable for stretchable applications2. Aimed at this crucial issue, in this study, we used an acrylic rubber sheet (AR) as a substrate and made wrinkle structure using an indium tin oxide (ITO) with 130 nm thickness as a thin film electrode material. The wrinkle structure electrode was fabricated by attaching the ITO film on one phase of the pre-stretched acrylic rubber sheet3. While the substrate restored, the ITO film was crumpled and made wrinkle structure due to difference of modulus. Depending on the degree of the pre-strain of the substrate, the wrinkle structure of the ITO film was influenced and the electrical behavior was also affected. The wrinkle morphology of the AR/ITO electrodes was observed by a scanning electron microscope. The wavelength appeared the uniformed sinusoidal wave which follows the finite-deformation buckling theory3. The high degree of pre-strain causes a short degree of the wavelength and the large degree of the amplitude. Also, to prevent from increasing electrical resistance because of the ITO cracks during crumpling, ionic liquids were dropped on the wrinkled ITO surface. Moreover, the transmittance (from 380nm to 780nm wavelength) of the AR/ITO electrodes is high. Even though more pre-strain causes lower transmittance, the 50% pre-strained electrode that is highest pre-strained shows over 35% transmittance and it is enough to distinguish the object which is displayed opposite site the electrode2. To verify the performance of the stretchable electrode, we made a
simple melody kit circuit with strain deformation. The electrodes thus boast wide applications including wearable and medical devices and electronics industry.

**Keywords:** stretchable electrode; wrinkle structure; conductive thin film; high transmittance; finite-deformation buckling model

*Presenting author*

**References**:

**OP-30**

**Dendrimeric tweezers/Dendrimeric macromolecular architectural motif and its applications.**

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**Abstract:**

In recent years with the development of nanoscience and technology, inorganic nano materials have gained many researchers attention because of their unique activities, such as small particle size, high surface area and surface energy.

Dendrimers have gained a broad range of applications in supramolecular chemistry, particular host guest relation and self-assembly processes. Dendrimers have become an ideal delivery vehicle candidate for explicit study of the effects of polymer size, charge and composition on biologically relevant properties such as lipid bilayer interactions, cytotoxicity, internalization, blood plasma retention time, bio distribution, and filtration.

Supramolecular dendrimers and their metal complexes and inclusion complexes are characterized and reported in this presentation.

**Keywords:** supramolecular chemistry, host guest relation.

**References:**
Antimicrobial Activity of PAMAM Dendrimer with CT Complex

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Abstract:
Dendrimers are repetitively branched molecules, that are known for their defined structure, low polydispersity and high functionality, these nanostructure macromolecules have shown their potential in entrapping or conjugating the high molecular weight hydrophobic/hydrophilic entities by HOST-GUEST interaction and covalent bonding respectively. The charge transfer of PAMAM dendrimer peripherally modified of 0.0G generation and CT complex has been synthesized and the result for structure modify, recorded for antifungal and antibacterial activity against selected strains depicted in this paper.

Keywords: Dendrimer, Polyamidoamines, Host-guest interaction, inclusion complex, microbial activity

References:

Scenario of Single-Use Plastic Ban in some Hotels, Restaurants and Vegetable Market of Nagpur City- A Case Study

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Abstract:
In today’s world plastic is part of everyone’s life. Plastics makes thousands of products that add convenience, comfort and safety. Due to its light weight, strength and easily mouldable ability it is used as an ideal packaging material. It is also used in many sports to increase athlete efficiency and safety. It increases the efficiency and hygiene of medicines from the surgery suite to the physician’s room. Inspite of many advantages one of the biggest disadvantage is that it will take 1000 years to decompose in Landfills. When it burns, it produces toxic gases which adds to environmental pollution, when it dumped in water bodies it threats aquatic life. It prevent the rainwater from seeping into the ground. However, the convenience of plastic bags come at a very high cost to the environment and negatively affects human health. 18 states have banned single-use plastic bags such as Maharashtra, Tamil Nadu and Madhya
Pradesh. Bangladesh and India has only banned the use and sale of polythene bags which basically have thickness of less than 50 microns. In order to study the awareness about single use plastic ban in Nagpur City, we conducted survey of some Hotels, Restaurants, Vegetable market and Grocery shops. From the survey it has been observed that though they are knowing about plastic ban but still plastics bags are used in markets illegally.

**Keywords:** Single-use plastic, plastic bags, bioaccumulation, environment, plastic ban

**References:**
3. 807-3705-9DTI/2179/JP
4. https://brainly.in

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**OP-33**

**Analytical Method Development And Validation of Ezetimibe By RP-HPLC**

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**Abstract:**
The present study describes the development of a validated RP-HPLC method for determination of Ezetimibe drug. The separation was carried out at 40°C on a Princeton C18 (5 µg, 250×4.6 mm) column with the methanol: Acetonitrile (25: 75%v/v) as a mobile phase at a flow rate of 0.8 ml/min. The wavelength detection was 232nm. The retention time of nearly 3.8 minutes was obtained. Analytical validation parameters such as specificity and selectivity, linearity, accuracy and precision were evaluated. The calibration curve was linear in the range of 2–20 µg/ml with a correlation co-efficient 0.999. Relative standard deviation values for all key parameters, was less than 2.0%. The method was validated according to ICH guidelines and the acceptance criteria for accuracy, precision, linearity, specificity and system suitability were met in all cases.

**Keywords:** Ezetimibe, RP-HPLC, Analysis, Validation

**References:**
**OP-34**

**Design, Synthesis and Biological Evaluation of Some Novel Imidazole Derivatives for Anti-inflammatory**

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*Presenting author: *Kundlik S. Khandare

**Abstract:**
In the present research, 1, 2, 4-trisubstituted-1H-imidazoles were synthesized by using nitrophenyl glyoxal with various substituted aryl aldehyde. The objective behind the research was to design and synthesize substituted imidazole derivatives and evaluate them for in vitro and in vivo anti-inflammatory activity. The purity and homogeneity of all the synthesized compounds were confirmed by their melting point, thin layer chromatography, UV spectrophotometry, and IR spectroscopy. In vitro anti-inflammatory activity of newly synthesized imidazole derivatives was carried out by protein denaturation method. Amongst all the synthesized compounds 3a, 3b, 3d and 4e showed good activity (60.39%, 72.49%, 84.76%, and 68.49%) against protein denaturation (albumin) compared with standard Diclofenac (85.82%). In vivo anti-inflammatory activity was carried out by carrageenan induced rat paw edema method. Amongst all the synthesized compounds 3a, 3b, and 3d showed better activity (60.39%, 72.49%, and 84.76 %,) against COX-2 receptor compared with standard Indomethacin. Thus, it can be concluded that the synthesized compounds can be a good candidate for anti-inflammatory activity.

**Keywords:** Imidazole, substituted aryl aldehyde, anti-inflammatory activity

**OP-35**

**Synthesis and Characterizations of Series of Heterocyclic Esters in Solvent free condition.**

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**Abstract:**
A series of different heterocyclic esters were synthesized by using sulfuric acid as a catalyst and hydrogen peroxide as a co-catalyst. The esterification was carried out under mild reaction conditions and without any additional organic solvent. The produced esters were recovered easily. The results showed that carboxylic acids were successfully converted into esters with good yields and high selectivity. Various synthesized products were characterized by ¹H NMR, mass spectrometry (MS), infrared (IR), and elemental analysis.

**Keywords:** heterocyclic acids, esterification, sulphuric acid and hydrogen peroxide
Analytical Method Development And Validation of Ambrisentan By RP-HPLC

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Abstract:
The present study describes the development of a validated RP-HPLC method for determination of Ambrisentan drug. The separation was carried out at 40°C on a Princeton C18 (5 μg, 250×4.6 mm) column with the Water: Acetonitrile (20:80%v/v) as a mobile phase at a flow rate of 1.0 ml/min. The wavelength detection was 263 nm. The retention time of nearly 3.9 minutes was obtained. Analytical validation parameters such as specificity and selectivity, linearity, accuracy and precision were evaluated. The calibration curve was linear in the range of 2–20 µg/ml with a correlation co-efficient 0.999. Relative standard deviation values for all key parameters, was less than 2.0%. The method was validated according to ICH guidelines and the acceptance criteria for accuracy, precision, linearity, specificity and system suitability were met in all cases.

Keywords: Ambrisentan, RP-HPLC, Analysis, Validation

References:

Design, Synthesis and Pharmacological Evaluation of Some Novel Pyridine Derivatives for Analgesic and Anti-inflammatory activity

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Abstract:
A series of some novel pyridine derivatives was synthesized which posses the potent analgesic and anti-inflammatory activities. The 2,3-diaryl-3H-imidazo(4,5-b)pyridines derivatives was synthesized by condensation of 2-chloro-3-nitro pyridine, substituted amine and substituted aldehyde. The synthesized compounds were characterized by melting point, thin layer chromatography and spectral studies. Molecular docking studies were performed by using Schrodinger 11.5 software to evaluate affinity of
synthesized compounds towards the COX-2 enzyme (PDB code: 3LN1) which is involved in inflammation. In vivo anti-inflammatory activity and analgesic activity was evaluated by using the Carrageenan-induced rat paw edema test and Writhing test respectively. The compound 5a, 5e, 5i and 5h was showed the potent anti-inflammatory activity and compound 5a,5b,5e and 5i showed the significant analgesic activity when compare to standard drug Indomethacin. It can be concluded that the substitution of electron withdrawing groups at -o and -p position of the phenyl ring attached to imidazolopyridine ring increases anti-inflammatory activity and substitution of electron donating group at -p position of phenyl ring attached to imidazolopyridine ring increases analgesic activity

**Keywords:** Pyridine, docking, heterocyclic, analgesic, anti-inflammatory

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**OP-38**

**A Review on Essential Minerals in Water required for Human Health and Nutrition**

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**Abstract:**
Water plays an important role in the body to perform various crucial functions. The relative contribution of water to the total dietary intake for selected trace elements and electrolytes lies between 1 and 20%. Minerals are inorganic supplements which are required for humans in limited quantities in the range of 1 to 4000 mg per day, depending upon the type of mineral. Requirement of minerals changes from gender to different age group, similar to that of nutrients and other basic nourishment supplements. Calcium (Ca) is essential for humans in the development of bone and proper working of nerves and muscles. Magnesium (Mg), copper (Cu), zinc (Zn), and iron (Fe) are significant co-factors which are essential in various biochemical reactions. Iodine (I) is required for the synthesis of thyroid hormones which control body’s metabolism and many other body functions. Potassium (K) is significant for maintaining osmotic harmony among cells, and the interstitial liquid. Red platelets cannot work properly without iron in Haemoglobin. Excessive consumption or insufficient intake of selected trace minerals can disturb the body balance and functions that promote health, and can cause various chronic effects. The paper assesses the alterations in various biochemical functions when these trace minerals are consumed in disproportionate manner. This paper critically emphasizes on the controlled uptake of vital minerals such as Ca, Mg, Fe, Zn, Cu, I, K from water.

**Keywords:** minerals; health; supplements; deficiency
OP-39

Alternative Methods for Chemical Disinfection of Potable Water

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Abstract:
Microbial contamination in drinking water proves to be a sustainable threat to human health. Several methods utilized for disinfecting contaminated drinking water varies from simple boiling method to advanced technologies such as membrane technologies (Microfiltration, Ultrafiltration, Reverse osmosis). Various methods practiced by industries, deals with chemical methods such as chlorination, ozone, hydrogen peroxide, sodium hypochlorite and halogens, which leads to formation of toxic by-product which degrade the quality of water. The present review paper discusses the available green disinfection methods and compares its effectiveness with the other physical and chemical methods.

Keywords: disinfection; chlorination; UV radiation; green disinfection methods

OP-40

A Review on Removal of Heavy Metals from Water by Adsorption

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Abstract:
Substantial contamination of heavy metals in drinking water has been an issue to consumers since long. The persisting contamination level has been monitored by various agencies and researchers, which direct towards constant deterioration of water quality. The quality of water is degrading exponentially from rural to urban areas in a significant manner. Industrial effluents, sewage and agricultural waste are the prime sources of contamination of water resources. Various heavy metals such as nickel, chromium, lead, arsenic, cadmium, mercury and copper are heavily present in industrial effluents. Though different methods such as chemical precipitation, ion exchange, membrane filtration, coagulation – flocculation and electro dialysis are known, amongst which adsorption being the most versatile and economically viable, has been extensively adopted by various researchers. In this review, several low cost adsorbents reported in the literature have been studied at length. Different types of adsorbents like nanosorbents, biosorbents, carbonaceous material and metal based adsorbents have been considered for the review paper. Study reflected towards remarkable adsorption capacity some of the natural adsorbents utilized by
researchers. The review paper evaluates the possibilities of utilizing various adsorbents for efficient removal of different heavy metals from water.

**Keywords:** heavy metal; adsorption; low cost adsorbents; wastewater treatment

**OP-41**

**Synthesis Of Biodiesel In Hydrodynamic Cavitation Technique**

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**Abstract:**

Biodiesel is produced from Mahua Oil through Transesterification process in Hydrodynamic Cavitation Technique (HCT) it included that the mahau oil is also a potential raw material for biodiesel. Biodiesel from mahua seed its important because 30-40% fatty oil called mahua oil.

HCT can simply be generated by using a constriction such as an orifice plate, venturi or throttling valve in a liquid flow. HCT based on the use of orifice plates. Transesterification is a reaction between a triglyceride & alcohol in the presences of alkali catalyst to produces glycerol & methyl ester.

In this experiment work in about the production of biodiesel (methyl ester) by using HCT minimum energy is required for the completion of transesterification reaction & higher yield of product was obtained. The reaction takes only 10-15 min.

It was found that optimum yield of 76.46 % is obtained at oil to molar ratio of 1:6 & catalyst concentration is 2.5 wt % of KOH. The characterization through a GC analysis is found that the Free Fatty Acid & Triglyceride are totally converted into the Fatty Acid Methyl ester.

**Keywords:** Biodiesel Production, Mahua Oil, Single Stage Transesterification, Hydrodynamic Cavitation Technique.

**References:**

Effect of Operating Parameters on Radiolytic Remediation of Carmine Dye Solutions


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Abstract:
It has been reported that the change in various operating parameters influence the degree and extent of degradation and thus the subsequent decoloration of aqueous solutions of synthetic dyes during gamma radiolysis. The influence of some operating parameters such as initial dye concentration, pH of dye solution, addition of H2O2 on gamma radiolytic decolorization of aqueous solutions of Indigo Carmine dye has been studied during the present communication. Gamma chamber GC-900 having 60Co as gamma radiation source at a dose rate of 0.386 kGy/hr was used as source of gamma radiation. The findings suggest that the dose of gamma radiations required to achieve the complete decolorization was found to depend directly on the concentration of dye solution. It was also observed that, as the pH of dye solution was increased, the rate and extent of decolorization was found to decrease irrespective of the concentration of dye solutions. The addition of H2O2 has the synergistic effect on the extent of decolorization. The addition of H2O2 was governed by the critical value which corresponds to optimum dose of H2O2 corresponding to maximum decoloration.

Keywords: Decolorization, dose rate, GC-900, water radiolysis.

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References:
A review on internal design modifications in activated sludge process: status, impact and recommendations

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Abstract

With water crisis getting severe each year all over the world, development in waste water recycling techniques has gained momentum to meet strict environmental norms and to take advantage of the renewability of water. Biological treatment methods predominate over other recycling methods as they are less expensive and do not generate secondary pollutants. Challenges faced in using these methods such as low oxygen solubility in water or insufficiency in maintaining booming environment for microorganisms and sludge water separation issues restrain their full fledge utilization, thus hampering expenditure control and the final effluent quality which can be achieved otherwise.

The developments made so far to overcome drawbacks of conventional activated sludge process revolves around modifications in suspended, attached growth process and improvements via integration of both these systems. Further process refinement includes modifications in aeration and sludge separation systems but lacks the cost analysis for scale up.

This paper critically reviews various internal design modifications made in aerobic treatment of wastewater by several researchers on lab and pilot scale to overcome the problem faced while operation. This paper also gives guidelines to meet the design objectives for a commercial scale wastewater treatment plant from process efficiency and economy aspects.

Keywords: chemical oxygen demand (COD); aeration modifications; wastewater treatment; biofilm media.
Review of Applications Of Ferroelectric Nanoparticles In Materials Technology

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Abstract:
Ferroelectric materials have been extensively studied because of their excellent ferroelectric, ferroelastic, pyroelectric, piezoelectric and inverse piezoelectric properties because of this they find a lot use in applications. Ferroelectric nanomaterials are used as Multilayered capacitors and nanocomposites. This review reports the present scenario of ferroelectric nanomaterials and provides an overview the applications of ferroelectric nanomaterials.

Keywords: air-to-air energy recovery system; hot-humid environment; performance; building applications

*Presenting author

References:
PP-1
Synthesis and Antibacterial Activity of 3-phenoxy Derivatives of Triazipino Benzoxazole.

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Abstract:

Novel fused heterocyclic compound 5-imino-3-methylthio-2,5-dihydro[1,2,4] triazipino[3,4-b] [1,3] Benzoxazole -4- carbonitrile (III) was prepared by the reaction of 2-hydrazino -1,3-benzoxazole (I) with 3,3’ Bismethylthio methylene malanonitrile (II) in presence of anhydrous K2CO3 in DMF and ethanol. Compound (III) has methylthio functionality at 3- position which is act as best leaving group. The derivatives of compound (III) were prepared by the reaction 5-imino-3-methylthio-2,5-dihydro [1,2,4] triazipino [3,4-b] [1,3] Benzoxazole -4- carbonitrile with different substituted phenols to afford 3-phenoxy derivatives of fused triazipino benzoxazole (compound III a-f).

All the synthesised compounds and 3-phenoxy derivatives of compound (III) were characterised by the spectral analysis. All the compounds were screened for their antibacterial activity against E. coli and Bacillus subtilis exhibited moderately active.

Keywords: 2- Hydrazino Benzoxazole, Triazipinobenzoxazole, anhydrous K2CO3, antibacterial activity.

PP-2
Degradation Profile of Metformin and Glimepiride By High Performance Liquid Chromatography

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Abstract:

A force degradation profile of Metformin HCl & Glimepiride in combine tablet dosage form on RP-HPLC was developed using Grace RP-C18 (4.6 x 150 mm, 5 µm) in an gradient mode with mobile phase
comprising of Acetonitrile: Dihydrogen Pott. Phosphate (pH 2.5 using 0.1% OPA) The flow rate was 0.7 mL/ min and effluent was monitored at 242 nm. The stress conditions selected on the basis of literature survey and drug profile. The analysis of the marketed formulation shows the % RSD of 0.37 and 0.99 for MET & GLIM which fully agrees with system suitability. All the system suitability parameters were fully obeyed during generation of force degradation profile.

**Keywords:** Ambrisentan, RP-HPLC, Analysis, Validation MET (Metformin), GLIM (Glimepiride), RP-HPLC, Force, Stress, Degradation.

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**PP-3**

**Analysis of Dolomite, Bauxite and Pyrolusite Ores Using Wet Chemical and XRF Analysis**

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**Abstract:**
Ores are of utmost importance to mankind in the present age. They are the minerals from which metals can extracted in profitable concentrations. In order to use the mineral as an ore, it should contain significant amounts of desired metal. Dolomite is the most important ore of calcium and magnesium. Bauxite is the chief ore of aluminium while pyrolusite is the main source of manganese. In the present study, these three ores were obtained from various agencies. They were analyzed using wet chemical methods and XRF technique. The results obtained through these two techniques were compared. Dolomite was found to contain significant amounts of CaCO\(_3\) and MgCO\(_3\). Bauxite was found to contain considerable amount of Al\(_2\)O\(_3\) while pyrolusite was found to contain MnO\(_2\).

**Keywords:** Ores, bauxite, pyrolusite, dolomite, analysis, XRF

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**PP-4**

**Effect of Synthesis and Processing Conditions on the Various Intrinsic Redox States of Conducting Polymers**

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**Abstract:**
The synthesis and characterization of conducting polymers have become two of the most important areas of research in the polymer and materials science during the past two decades. Among these polymers, the aniline polymers have been of particular interest because of their environment stability, high degree of processability and interesting redox properties associated with the chain nitrogens. The aniline polymers also exhibit crystallinity and solution or counterion-induced processability. Furthermore, the electrical properties of the aniline polymers can be substantially improved through secondary doping. The excellent processability, together with the presence of a number of intrinsic redox states, have substantially enhanced the potential applications of aniline polymers for use in practical devices.
In this paper, evolution of polyaniline structure during synthesis, synthesis of polyaniline with high intrinsic oxidation states and effect of processing conditions on intrinsic redox states of polyaniline are discussed.

**Keywords:** polyaniline, intrinsic redox states

*Presenting author*

**References**:

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**PP-5**

**Synthesis of Chlorinated N-Glucopyranosyl Thiocarbamides and 1,2,4-Dithiazolidines with Their Antimicrobial Activity**

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*Presenting author: Dr.Aruna Hardas

**Abstract:**
Present study deals with chorination of N-glucopyranosyl thiocarbamide and 1,2,4 dithiazolidine. Step of chlorination of pharmacological compound is important with respect to its pharmacological activities. Targeted chlorinated compounds were divided into two series. Series I is 1-tetra-α-acetyl –β-D glucopyranosyl -3-mono/di/tri chloro phenyl thiocarbamide and series II is 3-phenyl/p-chlorophenyl-4-mono/di/tri chloro phenyl -5-tetra-α-acetyl-β-D-glucopyranosylimino-1,2,4-dithiazolidine. The characterization techniques such as IR spectroscopy, NMR spectroscopy and Mass spectroscopy were used for analysis of chlorinated compounds. All chlorinated compounds were examined for their antimicrobial activities against gram (-) E.coli and gram (+) staphylococcus aureus. Compound 3-p-chlorophenylimino-4-p-chloro phenyl 5-tetra-a-acetyl-β-D-glucopyranosylimino-1,2,4 dithiazolidine (IIa) and 3 p-chlorophenylimino-4 (2, 4 dichloro) phenyl 5-tetra-a-acetyl-β-D-glucopyranosylimino-1,2,4 dithiazolidine (IIb) were found to be most effective over wide range of time period particularly for 24h, 48h and 72 h.

**Keywords:** Chlorination of N-glucosyl thiocarbamide; Chlorination of dithiazolidine; Mass fragmentation pattern; NMR; antimicrobial activities

**References :**
A Brief Review on Thiazolidinones and Azetidinones:
Synthesis and Biological Activities

Babita G. Yadao*, Himani N. Chopde¹, Pooja N. Verma¹, Doyel M. Bhattacharya¹, Mangesh B. Thakre¹

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Abstract:
Heterocyclic chemistry is one of the most important key branch of chemistry which deals with the synthesis, properties and applications of heterocyclic compounds. Heterocycles have huge potential as the most promising lead molecules and play a very important role in the biological processes and are wide spread as natural products. Thiazolidinone(fig.a), a saturated form of thiazole, is a five membered ring with nitrogen, sulphur and carbonyl group on the fourth carbon. It has been considered as one of the magic molecule which is having almost all types of biological activity. On the same note the cyclic azetidinone(fig.b) skeleton has been extensively used as a template to build the heterocyclic structure fused to the four membered rings. Azetidin-2-ones (β-lactam) have received considerable attention mainly because of the antibacterial properties of penicillin and cephalosporins. The present review is an attempt to compile all recent synthesis and biological activities of derivatives of thiazolidinones and azetidinones to express their importance under one roof [1-6].

Fig.(a)Thiazolidinone Fig.(b)Azetidin-2-ones.

Keywords: Thiazolidinones; Azetidinones; Different Synthetic Methods; Biological Activities.

References:
PP-7


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Abstract:
Nanoparticles formulated from biodegradable polymers like poly(lactic-co-glycolic acid) (PLGA) are being extensively investigated as drug delivery systems due to their two important properties such as biocompatibility and controlled drug release characteristics. The aim of this work is to formulate isoniazid loaded PLGA nanoparticles. Polyvinyl alcohol (PVA) is used as stabilizing agent. The PLGA nanoparticles (NP) of hydrophilic drug isoniazid (INH) a first line antituberculosis drug are developed and entrapment efficiency of drug in the NPs has been improved. This work investigates the effects of some preparation variables on the size and shape of nanoparticles prepared by solvent evaporation method. These nanoparticles were characterized by photon correlation spectroscopy (PCS), transmission electron microscopy (TEM). Zeta potential study was also performed to understand the surface charge of nanoparticles. The drug release from drug loaded nanoparticles was studied by dialysis bag method and the in vitro drug release data was also studied by various kinetic models. The results show that sonication time, polymer content, surfactant concentration, ratio of organic to aqueous phase volume, and the amount of drug have an important effect on the size of nanoparticles. Hopefully we produced spherical shape isoniazid loaded PLGA nanoparticles with a size range under 250 nm with zeta potential –23.3 mV. The in vitro drug release analysis shows sustained release of drug from nanoparticles and follow Korsmeyer-Peppas model.

Keywords: Biodegradable polymer, sIsoniazid, solvent evaporation technique, Nanoparticles, Release kinetic model

PP-8

Sulfur-Sulfur bond formation through Cyclocondensation: Synthesis of 1, 2, 4, 6-dithiadiazepin and their Antimicrobial activity

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Abstract:
The highly electrophilic central carbon atom of the isothiocyanate or substituted isothiocyanate (R-N=C=S) react rapidly, under mild conditions with 1-(4-aminophenylsulfonyl) guanidine to give 1-(N-4-aminophenylsulfonylcarbamimidoyl)-3-aryltiourea. Then highly reactive reagent Naryl-S-chloro isothiocarbamoyl chloride reacted with 1-(N-4-aminophenylsulfonylcarbamimidoyl)-3-aryltiourea, to produced N-(3,7-bis(aryl limino)-4,7-dihydro-3H-1,2,4,6-dithiadiazepin-5-yl)-4-aminobenzenesulfonamide monohydrochloride which on basification with dilute sodium hydroxide or ammonium hydroxide give title compound that is N-(3, 7-bis (arylmino)- 4, 7-dihydro-3H-1, 2, 4, 6-dithiadiazepin-5-yl)-4-aminobenzenesulfonamide. Reagent N-aryl-S-chloro isothiocarbamoyl chloride

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was prepared with known procedure. Chloroform was used as a solvent in each step. Thus, in the synthesis of 7-membered heterocycles containing two sulphur and two nitrogen atoms through carbon-nitrogen and sulfur-sulfur bond formation were explored. The chemical structures of these new compounds were elucidated by IR, \(^1\)H NMR, Mass spectra, and elemental analyses. Synthesized compounds were screened for their antifungal and antibacterial activity.

**Keywords:** 1, 2, 4, 6-dithiadiazepine, antibacterial antifungal activity, isothiocyanate, 4-amino benzene sulfonamide

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**PP-9**

**Adsorption Studies of Phenols on Low Cost Adsorbent**

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**Abstract:**

Phenols are highly toxic and prolonged exposure is detrimental to human health. Therefore, adsorption of ortho, para and meta nitrophenols have been studied using granular activated charcoal, naturally obtained waste plant seeds of Albezia Lebbeck and Pongamia Ponnata and their derived charcoal\(^1\). The charcoals from these seeds have been prepared in laboratory by carbonisation process in absence of air\(^2\). The effects of various factors such as adsorbent dose, pH, phenol concentration, and temperature on adsorption capacity were investigated\(^3\). The suitability of the Freundlich, Langmuir, and Redlich–Peterson adsorption models to the equilibrium data was investigated for each phenol–adsorbent system. The method is found to be very stable and economically viable.

**Keywords:** Nitro substituted phenols, Adsorption isotherm, spectrophotometry, sensitive, stable.

**References:**

Structural Electrical and Magnetic Charactirization of Chromium Substituted Synthesized Spinel Ferrites by Microwave Sol- Gel Autocombustion Method

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Abstract:
Chromium substituted nickel ferrite $\text{NiCr}_x \text{Fe}_{2-x} \text{O}_4$ particles had been prepared by a modified microwave assist sol-gel autocombustion in nitrate urea method. Structural and magnetic properties were systematically investigated. Rietveld refinement of X-ray powder diffraction results showed that the sample was cubic single-phase with the space group of Fd3m and cell parameter values of $a = 8.328\text{Å}$. The results of TEM and SEM microscopy showed that the grains were polycrystalline with sizes from 12 to 48 nm. magnetic saturation and coercivity of the synthesized materials were characterized by VSM.

Keywords: spinel ferrites , chromium substitutions, Magnetic properties, VSM; TEM, PXRD

References
**PP-11**

**Na\(_6\)Al\(_6\)Si\(_{10}\)O\(_{32}\): Eu\(^{3+}\) phosphor**

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**Abstract:**
In the present report Eu\(^{3+}\) activated Na\(_6\)Al\(_6\)Si\(_{10}\)O\(_{32}\) phosphor synthesized by simple combustion method using urea as a fuel. The structure and morphology of the samples were analyzed by X-ray Diffraction (XRD) and Scanning Electron Microscopy (SEM) which showed that the samples were crystallized in a well known structure and FT-IR for determine vibrational feature of proposed phosphor. Thermoluminescence (TL) technique is discussed in this present work. TL characteristics show the concentration quenching observed at 1 mol% of Eu\(^{3+}\) ion activated Na\(_6\)Al\(_6\)Si\(_{10}\)O\(_{32}\) phosphor with single TL glow peak 173 °C at higher temperature. Prepared phosphor material was irradiated oxygen ion beam different flunces range from 5×10\(^{10}\) to 1×10\(^{14}\) ions/cm\(^2\). Oxygen ion irradiated Na\(_6\)Al\(_6\)Si\(_{10}\)O\(_{32}\): Eu\(^{3+}\) samples show the linear response curve in the fluence range from 5×10\(^{10}\) to 1×10\(^{12}\) ions/cm\(^2\). Deconvolution was applied using the computerized glow curve fitting method on the glow curve for optimized conditions. Chen's peak method, Initial rise method and Ilich method was used to evaluate the trapping parameters namely, activation energy (E), frequency factor(s), kinetic order (b) associated with the main glow curve in Na\(_6\)Al\(_6\)Si\(_{10}\)O\(_{32}\): Eu\(^{3+}\) phosphor after irradiation.

**Keywords:** Thermoluminescence; Oxygen ion beam; Trapping parameter; phosphor; XRD

**References:**

**PP-12**

**Efficient Treatment of Wastewater by Natural Adsorbents**

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**Abstract:**
Pollution is the one of the serious problem now a days. Environmental problems are increasing day by day and are threatening the survival of mankind of earth. Discharge of industrial wastewater has increased, with rapid increase in population and growth of industrialization, quality of both surface and ground water is changing day by day\(^1\). Waste water contains so many metal ions which are harmful for human being.
The most common heavy metals are Cd, Cr, Cu, Hg etc. chromium is one of the major metal ion hazardous for human, it causes skin ulcers, lung, nasal and sinus cancer. when chromium is inhaled its compounds are respiratory track irritants and can cause sensitization. Several treatments are used for removing metals from waste water includes Reduction, precipitation, ion exchange, electrochemical reduction and reverse osmosis. These are very expensive, not to eco-friendly high power requirement and incomplete metal removal. Adsorption technique is successively alternative process that utilized for removing heavy metals from industrial waste water, which can be performed in batch mode or continuous process. Adsorption processes have offered flexibility in design and operation in design and operation and in many cases will produce high quality treated effluent.

The aim of this work is to study the removal of Cr$^{6+}$ from the waste water using different adsorbents: activated mustard seed and fenugreek seed. The influence of adsorbent dosage, pH and contact time on the efficiency of Cr$^{6+}$ were investigated to obtain the better operating conditions of adsorption processes. Adsorption isotherms model namely, Langmuir and Freundlich were studied to describe the adsorption equilibrium.

**Keywords:** wastewater; heavy metals; adsorption; Freundlich isotherm

**References:**

**PP-13**

**Adsorptive Removal of Congo Red onto Activated Carbon Prepared by Chemical Activated of Industrial Waste Lignin**

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**Abstract:**
Currently much of the lignin produced in paper and pulp industry is consumed as a waste which is generally used only for its fuel value; therefore it can be of interest to prepare a high value and low cost product such as activated carbon from lignin. This study investigates the potential use of activated carbon prepared from industrial waste lignin (IWL) using ZnCl$_2$ as an activating agent. The prepared activated...
carbon was used for adsorption of the Congo Red (CR) dye. Here an attempt has been made to study the applicability of industrial waste lignin as potential dye adsorbent to remove congo red from aqueous solution and polluted water. The effects of operational parameters toward the Congo red adsorption on activated carbon, including adsorbent dosage, initial pH, contact time and initial concentration were investigated. Langmuir, Freundlich and B.E.T. isotherms were applied to the data obtained at equilibrium. A maximum adsorption capacity of 33.33 mg/g of congo red was achieved by activated carbon prepared from industrial waste lignin using ZnCl₂. The adsorption isotherm study describe that the adsorption process followed the Langmuir and B.E.T. isotherm models with R² values ~0.97. The kinetic data obtained at different concentrations was analyzed to predict the constant rate of adsorption using Langmuir adsorption kinetics model. It shows that the rate of adsorption is very high as compared to the rate of desorption which indicates malachite green dye is irreversibly adsorbed on the adsorbent.

**Keywords:** Activated carbon, Industrial Waste Lignin, Equilibrium Isotherm, Industrial waste lignin, kinetics

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**PP-14**

**Carbonyl-Bridged Triarylamine and Diketopyrrolopyrrole functionalities to Generate a Three-Dimensional, Non-fullerene Electron Acceptor**

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*Presenting author- Rahul V. Hangarge

**Abstract:**

There has been a dramatic surge in the development of non-fullerene acceptors (NFAs) indicating that a variety of structural types can be used as NFA targets.¹ The types such as acceptor-donor-acceptor, acceptor-acceptor-acceptor and three-dimensional with twisted configuration are the most successful and exploited structural types, with some examples possessing superior properties when compared to their fullerene-based counterparts.² The NFAs should be based on simple and scalable synthetic protocols, address the limitations of fullerene-based acceptors, and also have energy levels matching those of the conventional and conjugated polymeric and small molecular donor functionalities.

However, many NFA targets based on these formats are small molecules that may exhibit higher crystallinity and large coplanar structures, resulting in excessive aggregation that leads to unfavourable blend surface morphologies. This issue can be solved with the development of non-planar or three-dimensional structural types. In this work, we described for the first time the use of a carbonyl-bridged triarylamine core with diketopyrrolopyrrole terminal units to generate a three-dimensional, non-planar non-fullerene electron acceptor with favourable properties for use in organic photovoltaic devices.

The carbonyl-bridged triarylamine-functionalized, small molecule non-fullerene electron acceptor, 2,6,10-tris(5-(2,5-bis(2-ethylhexyl)-3,6-dioxo-4-(thiophen-2-yl)-2,3,5,6-tetraphydropyrrolo[3,4-c]pyrrol-1-yl)thiophen-2-yl)-4H-benzo[9,1]quinolizino[3,4,5,6,7-defg]acridine-4,8,12-trione (coded as R₁), was synthesized via the industrially viable Suzuki coupling reaction using the commercially and cheaply available substrates. Using PTB7 as a donor, a power conversion efficiency of 9.33% was achieved in simple, solution-processable bulk-heterojunction devices, a result that is amongst the best in the literature for three-dimensional non-fullerene acceptors.

**Keywords:** Solar cells; diketopyrrolopyrrole; 3-dimentional; non-fullerene acceptor; Bulk-heterojunction
References:


PP-15

Comparative Study of Diabetic Drugs with Natural Curry Leaves by Ultrasonic Method

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Abstract:
In the present study, ultrasonic velocity (υ), density (ρ), and viscosity (η) have been measured at frequency 1 MHz. The nature of intermolecular interactions in the aqueous and alcoholic solution in different concentrations (1%, 0.5%, 0.25%, 0.125%) of diabetic drug Glibenclamide and Glimepiride and Natural product Murraya koenigii (curry leaves). Ultrasonic velocity, density, viscosity measurements have been supported for the evaluation of acoustical and thermo-dynamical parameters e.g. acoustic impedance, adiabatic compressibility, free length, relaxation time, Gibbs free energy, etc. these properties provide important information about molecular motion and various types of inter-molecular interaction. The data of various parameters by ultrasonic study of drug Glibenclamide and Glimepiride and leaves extract solution of Murraya koenigii in water, ethanol and 2-propanols were interpreted. The measurement of ultrasonic velocity in pure liquids and mixtures is an important tool to study the physico-chemical properties and also explains the nature of molecular interactions. Ultrasonic is a versatile non-destructive technique and highly useful for the investigation of various physical properties. Recent developments have found use of ultrasonic energy in medicine, engineering and agriculture. The drug–solvent molecular interaction plays an important role in the understanding of drug action.

Keywords: Glibenclamide; Glimepiride; Murraya koenigii (curry leaves); free length; acoustical parameters, ultrasonic velocity
PP-16
Synthesis of Iron Perovskite using Rust Wastes as Inorganic Precursor by Solution Combustion Synthesis

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Abstract:
Rust waste from an electricity transmission tower manufacturing industry were used as iron precursor for the preparation of LaFeO3 perovskite-type compounds by solution combustion synthesis. The iron precursor and the LaFeO3 powders were characterized by several techniques such as microwave plasma-atomic emission spectroscopy, powder X-ray diffraction coupled with Rietveld refinement, temperature programmed reduction, X-ray photoelectron spectroscopy, Fourier Transform analysis, scanning electron microscopy. Propylene oxidation catalytic reaction was chosen to test their catalytic activity as a function of the iron precursor amount. A comparative study was performed with a LaFeO3 powder obtained from a commercial iron precursor. Results showed that this ecofriendly strategy allows producing iron perovskite with comparable catalytic activity and higher benefit for the environment.

Keywords: perovskite-type catalysts, solution combustion synthesis, X-ray diffraction, rust wastes, propylene oxidation.

PP-17
Thermodynamic Properties of Aqueous Solutions of β-alanine at Different Low Temperatures

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Abstract:
The experimental data of density (ρ) and speed sound (u) in the temperature range (275.15 to 283.15) K have been obtained for the aqueous solutions of β-Alanine in the concentration range (0.05 to 2.0) mol.kg⁻¹. The data obtained are used to calculate the derived parameters, isentropic compressibility of solution (βs), apparent molar volume of solute (φ̃v) and apparent molar compressibility of solute (φ̃KS). The limiting values of apparent molar volume of solute (φ̃v₀) and apparent molar compressibility of solute (φ̃KS₀) have also been obtained. The results have been interpreted in terms of solute-solute and solute-solvent interactions.

Keywords: Density, Speed of Sound, β-Alanine.
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Comparative Adsorption of Indigo Carmine Using Chitosan and Cross Linked Chitosan

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Abstract:
Comparative adsorption of anionic dye (Indigo carmine) using chitosan and cross linked chitosan was studied. Chitosan was cross linked with formaldehyde in order to increase its adsorptive capacity. The synthesized chitosan composite was characterized for detection of functional groups, surface morphology, elemental analysis, thermal stability, X-ray diffraction, surface area and pore size as well which confirms successful blending of the chitosan composite. The batch adsorption experiments were carried out which show that the cross linked chitosan has high adsorptive capacity over a pH range of 3.0 to 9.0, contact time 30 min, initial concentration of 100 ppm using 50 mg adsorbent dose while the chitosan shows less adsorption in similar conditions. Thus, it was found that crosslinking agent increases the adsorption capacity of chitosan. The percentage adsorption of cross linked chitosan was found to be 90% while that with chitosan it was only 30%. Therefore, the functionally modified chitosan can be used for effective adsorption of the Indigo carmine dye.

Keywords: Cross linked chitosan composite, indigo carmine.

Study of Solvation Behaviour of Biologically Active Amino Acid Derivative D(+) Glucosamine Hydrochloride in an Aqueous Medium at Different Temperatures

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Abstract:
The systematic measurements of densities ($\rho$) and speeds of sound ($u$) of aqueous binary mixtures of biologically active amino acid derivative D(+)-Glucosamine Hydrochloride at different temperatures i.e. $T = (278.15, 288.15$ and $298.15)$ K and at one atmospheric pressure within the concentration range of $(0.04 – 0.16)$ mol.kg$^{-1}$ were carried out. The obtained data of densities and speeds of sound of solutions were used to calculate different derived parameters such as apparent molar volume of solute ($V_{\phi}$), isentropic compressibility of solution ($\kappa_s$) and apparent molar isentropic compressibility of solute ($\kappa_{\phi}$).
The limiting values of apparent molar volume of solute \((V^o_\phi)\) and apparent molar isentropic compressibility of solute \((\kappa^o_\phi)\) have also been obtained. Hydration number \((n_H)\) at all three temperatures, \(T = (278.15, 288.15\text{ and } 298.15)\text{ K}\) were evaluated from speed of sound data. The results have been interpreted in terms of various interactions among solute and solvent molecules such as hydrogen bonding and solute-solvent interactions\(^1\).

**Keywords:** Density, Speed of sound, Apparent molar volume, Isentropic compressibility, Hydration number.

**References:**

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**PP-20**

**Study of Molecular Interaction of Binary Mixture Liquid of \(\alpha\)-benzlidine \(\beta\)-benzoyl propionic acid in ethanol at room temperature by using Ultrasonic Interferometer**

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**Abstract:**
The synthesized compound, i.e. \(\alpha\)-benzlidine \(\beta\)-benzoyl propionic acid\(^1\) has been confirmed by IR, NMR spectra. The density, viscosity and ultrasonic velocity of \(\alpha\)-benzlidine \(\beta\)-benzoyl propionic acid in ethanol at room temperature has been determined. By using this value of density and ultrasonic velocity, the different acoustic parameters such as acoustic impedance, adiabatic compressibility and molecular free length has been determined which is helping to discover the molecular interaction of synthesized molecule, i.e. \(\alpha\)-benzlidine \(\beta\)-benzoyl propionic acid with ethanol at room temperature.

**Keywords:** \(\alpha\)-benzlidine \(\beta\)-benzoyl propionic acid, Density, Viscosity, Ultrasonic velocity interferometer

**References:**
Synthesis, Characterization and Biological Activities of Azetidin-2-one and Thiazolidin-4-one Derivatives

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Abstract:
In the present work, we herein report the synthesis of 3-chloro-1-(4-((2-hydroxyphenyl)(8-hydroxyquinolin-7-yl)methylamino)phenyl)-4-(aryl)azetidin-2-ones and 3-(4-((2-hydroxyphenyl)(8-hydroxyquinolin-7-yl)methylamino)phenyl)-2-(aryl)thiazolidin-4-ones by using novel Schiff base i.e. 7-((4-(arylbzylidenemino)phenylamino)(2-hydroxyphenyl)methyl)quinolin-8-ols. The Schiff bases were synthesized by using 7-((4-aminophenylamino)(2-hydroxyphenyl)methyl)quinolin-8-ol. The structures of the newly synthesized azetidin-2-one and thiazolidin-4-one derivatives were confirmed by IR, 1H-NMR, elemental analysis and mass spectroscopic data. In-vitro biological evaluations of azetidin-2-ones and thiazolidin-4-ones were done against gram-positive and gram-negative bacterial strains using the well diffusion method. It has been observed that some of these derivatives posses potent biological activity against these bacteria.

Keywords: 8-Hydroxyquinoline; Schiff base; Azetidinone; thiazolidinone; Anti-bacterial Activity; Spectral Analysis.
Effect of surfactants on the adsorption capacity of chitosan – bentonite composite towards crystal violet dye

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Abstract:
The wastewater coming from paper, rubber, plastics, cosmetics and textile industries is always associated with dyes. These dyes have become a potential source of pollution as most of them are inert towards oxygen, light, acids and bases. Some of them are carcinogenic hence if left untreated it may affect the ecosystem adversely thus their removal from wastewater is essential. This can be done effectively by using various adsorbents. Surfactants are extensively used in textile, fibre, paint, polymer and paper industries. As a consequence, in many industrial wastewaters the co-occurrence of both surfactants and dye is observed. Hence it is necessary to study the effect of surfactants on the adsorption capacity of adsorbents. In the present work, the effect of Cationic, Anionic and Non-Ionic surfactants namely TBAB, SDS and Triton X-100 have been studied on the adsorption capacity of Chitosan – Bentonite composite for the adsorption of Crystal Violet Dye. The experiments have been performed in batch mode at natural pH of solution giving contact time of 30 minutes. Conclusively, it was established that the non-ionic and anionic surfactants affect the adsorption of Crystal violet adversely when their concentration is increased whereas no considerable effect was observed in case of cationic surfactants.

Keywords: Adsorption, Surfactants, Cationic surfactant, Anionic Surfactant, Non-ionic surfactant, Crystal Violet, Chitosan-Bentonite composite, SDS, TBAB, Triton X-100
*Presenting author

Synthesis and Molecular Docking Study of Substituted Chalcone Scaffold as a Potential Cyclin-Dependent Protein Kinase 2 (CDK-2) Inhibitors

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Abstract:
A series of novel chalcone1-4 derivatives were designed and evaluated in silico for drug-likeness behavior due to large number of replaceable hydrogen that allow a large number of derivatives. The synthesized
compounds were characterized by IR, $^1$H-NMR, $^{13}$C-NMR, and mass spectral analysis. Induced-fit molecular docking (IFD) was performed to study the anti-cancer activity virtually by using Autodock software and compared with the natural kinase inhibitor ligand \textbf{FB8(4-(2-methyl-3-propan-2-yl-imidazol-4-yl)-\textbar N)-(4-methylsulfonylphenyl)pyrimidin-2-amine}). Docking parameters showed that more than 5 analogues are better ligands than the already established natural inhibitor \textbf{FB8} against the protein crystal structure PDB ID 6GUE. Effective free binding energies, receptor interaction sites, ligand interacting moieties, amino acid residues involved in ligand–receptor complex and displayed better inhibition. The study has proven usefulness of chalcone based inhibitors for the development of new medicinal agent having better potency and lesser toxicity.

**Keywords:** chalcone; in silico; anti-cancer; induced-fit molecular docking (IFD); inhibitors

**Reference:**

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**PP-24**

**A Facile Synthesis and Biological Activity of Some New Pyrimidine-2,4,6-Triones Analogues and their O-β-D-Glucosides**

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*Kishor M Halzade*

**Abstract:**

The condensation of various 1,3-disubstitutedpyrimidine-2,4,6(1H,2H,3H)-triones \textbf{2a-g} with 3-formyl-4H-chromen-4-one \textbf{1} has been resulted in the formation of new 5-[(7-hydroxy-4-oxo-4H-chromen-3-yl)methylene]-1,3-disubstitutedpyrimidine-2,4,6(1H,2H,3H)-triones \textbf{3a-g}. These compounds have been used for the synthesis of medicinally important 5-[(7-O-\textbar D-glucopyranosyloxy-4-oxo-4H-chromen-3-yl)methylene]-1,3-disubstitutedpyrimidine-2,4,6(1H,2H,3H)-triones \textbf{6a-g} using acetobromoglucose (ACBG) as a glucosylating agent in the presence of dodecyltrimethylammonium bromide (DTMAB) as a phase transfer catalyst. The structures of the product have been confirmed based on $^1$H NMR, $^{13}$C NMR, ES-MS, optical activity, and elemental analysis. These mixes were assessed for their in vitro biological action.
Keywords: Pyrimidine-2,4,6(1H,2H,3H)-triones, chromones, glucosylating agent, α-acetobromoglucose, deacetylation, biological action.

*Presenting author

PP-25

Design, Synthesis and Biological Screening of Novel 3-[2-(9h-carbazole-9-yl)-2-oxoethylamino]-2-arylthiazolidine-4-one as Antimicrobial Agent

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Abstract:
In this study, design and synthesis of novel 3-[2-(9h-carbazole-9yl)-2-oxo-ethylamino]-2-arylthiazolidine-4-one was started with carbazole as basic pharmacophore and evaluated for antimicrobial activity. Carbazole is an important scaffold known to be associated with several biological activities including antimicrobial activities. Incorporation 4-oxothiazolidine moiety in carbazole moiety may lead to a new series of antimicrobials compounds. After molecular docking active compound were Synthesized and screened for in vitro antimicrobial activity against candida albicans and gram-positive and gram-negative bacterial strains such as S. aureus, B. subtilis, E. coli. All Compounds shown good antimicrobial activity at 150 (µg/ml) - 200 (µg/ml). The molecular docking studies demonstrated ligand protein interaction.

Keywords: Molecular Docking; Carbazole; Oxothiazolidine; Antimicrobial activity; Antifungal activity

References:
Chelate Polymers Derived from Isophthaloyl bis(isonicotinoylhydrazone) ligand: Synthesis, Spectroscopic Studies and Thermal Degradation Kinetics

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Abstract:
A new polydentate bis-ligand has been derived from isonicotinic acid hydrazide (INH) and isophthaloyl chloride. The characterization of synthesized ligand has been carried out using $^1$H and $^{13}$C NMR, FTIR spectra and ESI mass spectrometry. New chelate polymers of transition metals viz. Mn(II), Fe(II), and Co(II) have been synthesized from isophthaloyl bis(isonicotinoylhydrazone) (IPBI) bis-ligand and transition metal salts. The analytical data of chelate polymers are found to be consistent with 2 : 1 (metal : ligand) stoichiometry. The probable structures of synthesized chelate polymers with respect to stereochemistry have been assigned on the basis of elemental analyses, magnetic susceptibility studies, diffused reflectance spectra, XRD, SEM and thermogravimetric analyses. The IR spectral data depicts that isophthaloyl bis(isonicotinoylhydrazone) ligand acts as an octadentate chelating ligand. The Infrared and electronic spectral studies and magnetic behaviour of chelate polymers confirm tetrahedral geometry of Mn(II) chelate polymer and octahedral geometry of Co(II) and Fe(II) chelate polymers. The thermal stabilities of these polymers have been investigated by thermogravimetric (TG/DTG/DTA) techniques. The thermal degradation kinetics and various kinetic parameters of the chelate polymers have been evaluated with the aid of Coats–Redfern method.

Keywords: Chelate polymer; Isonicotinic acid hydrazide; FTIR; Thermal analysis; Coats-Redfern method

References:
Synthesis And Antioxidant and Antifungal Active of Various Novel Substituted Phenothiazines Derivatives

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Abstract:
Aims: In recent years there is a tremendous increase of drug resistant pathogens, leading to the design and development of newer antibacterial agents. Various novel substituted phenothiazines derivatives have been prepared to study on the basis of pharmacological activities in drugs discovery.
Methods: Phenothiazine derivatives substituted in the 2, 3 and 4 positions belong to a big group of tricyclic aromatic compounds. They are in extensive use in psychiatry as tranquilizers and neuroleptics. Due to their characteristic structure they exhibit many valuable analytical properties. A short facile synthesis of 8-(2//-3//, 5//-dimethyl-4//-ethoxy carbonyl pyrrolyl) hydrazine] substituted phenothiazines (5a-j) from 2-arylamino benzal-2-(3′,5′-dimethyl-4′-ethoxy carbonyl pyrrole]hydrazines (4) in presence of sulphur and iodine.
Results: These compounds show antibacterial and antifungal activities when compared with standard drug Norfloxacin and Griseofulvin against Bacterial cultures such as Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus, Proteus vulgaris and fungal cultures such as Aspergillus niger and Candida albicans. And also these compounds were screened for their antioxidant activity. The synthesized compounds are characterized by FTIR, 1H NMR, elemental and chemical properties.

Keywords: Antioxidant active, Antifungal Activity, Pyrrolyl, Phenothiazines

References:
2. Arpinskat J, Starczewska B, Puzanowska TH, (Medical research owing to their pharmacological activity), Analytical Sciences, 12, 1996.
A Novel Approach for Capacitive Deionization of Water with CNT/Fe-MOF Metal Organic Framework Electrode

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Abstract:
Capacitive deionization (CDI) has attracted the interest of the community as it offers an appropriate route to obtain clean water. It is a simple and high energy efficient method to convert the brackish water into clean water. The technology is based on the recognitions that high surface area electrode, the electrode which should be stable and chemically resistant at high temperature and voltage. The electrode materials play an important role in enhancing the CDI performance. The electrode materials should be rich in surface area and uniform pore size distribution so that ions able to move fast through the pore network and possess high salt electrosorption capacity. The high surface area electrode gets charged at successive voltage, can quantitatively absorb ionic component from water, thereby resulting in desalination. This renders the electro sorption process quantitative and attractive for water treatment. The former work demonstrated the iron metal organic framework supported CNTs for improving the surface area of electrode material. The obtained electrode material was coated on SS mesh substrate and possesses not only the conducting network for rapid electron transport but also the high diffusion length of ions which exhibit the excellent desalination performance with high salt absorption of 11.54 mg at 1.6 V of potential with initial concentration of 500 mgL−1 NaCl solution. These results extended the work of MOFs derivative for capacitive deionization methods.

Keywords: CNTs, Metal Organic Framework, MOFs, high electrosorption, capacitive deionization
**Keywords:** Docking; topoisomerase-II; aromatase enzyme; CDK2; phenothiazine derivatives of sulfonamide; anticancer evaluation; etc.

**References:**

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**PP-30**

**Synthesis of 2, 4, 5 - Triaryl Imidazole Derivatives from Benzoin**

**By Using Sulphanilic Acid Catalyzed Reaction**

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**Abstract:**
Imidazole derivatives are important of heterocyclic compounds because they constitute many natural products and pharmacologically active compounds. These compounds have typical importance due to their extensive biological activities and their use in synthetic chemistry. The simple and efficient procedure for a four-component condensation benzil or benzoin, ammonium acetate, aromatic aldehydes and sulphanilic acid as a catalyst in mild reaction conditions to synthesis of some 2,4,5- triaryl substituted imidazole derivatives. The advantages of this method are excellent yields with shorter reaction time, eco-friendly, inexpensive. The catalyst used are readily available and highly effective.

**Keywords:** Benzil, Benzoin, Ammonium acetate, aromatic aldehydes, triarylimidazoles, Sulphanilic Acid.

**References:**
PP-31

Synthesis, Molecular Docking, and Antidepressant Activity of some Benzopyridine derivatives

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Abstract:
Benzopyridine is also called as quinoline or l-azanaphthalene which are obtained by ortho-condensation of benzene ring with pyridine and naturally obtained from cinchona bark. In the present study, nine substituted benzopyridine (4a-i) have been synthesized in two step reaction. In first step reaction, 4, 7-dichlorobenzopyridine and 1,3-diaminopropane reacted to obtain N-(7-chlorobenzopyridin-4-yl)propane-1,3-diamine. Second step involves synthesis of 7-chloro [4-{3-(substituted imidazolyl)propyl}amino] benzopyridine derivatives (4a-i) from various substituted benzenaldehyde. All the synthesized compounds were confirmed by melting point and thin layer chromatography. Their structures were confirmed by infrared spectroscopy. Molecular docking studies were performed by using Schrodinger 11.5 software to evaluate affinity of synthesized compounds towards the SERT enzyme (PDB code: 6AWP) which is actively involved in depression. The compounds were tested for antidepressant activity by forced swimming test (FST) to get the percentage decrease in immobility duration (%DID). The test compounds 4c, 4e, 4h and 4i showed good antidepressant activity when compared to standard drug fluoxetine. It can be concluded that the substitution of electron withdrawing groups at -o and -p position of the phenyl ring attached to benzopyridine ring increases antidepressant activity.

Keywords: 1 Benzopyridine; docking; SERT; depression; antidepressant activity

PP-32

Deployment and Comparison of Eucalyptus camaldulensis tree bark and Delonix regia as a bioadsorbent material for the remediation of heavy metals from waste water

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Abstract:
The use of Eucalyptus camaldulensis tree bark (ECTB) and Delonix regia fruit pod as the low-cost biosorbent was examined as a substitute for contemporary costly techniques of removing copper ions from aqueous solutions. Batch adsorption studies were conducted to examine the effects of physico-
chemical key parameters such as the stirring rate, initial metal ion concentration, pH, agitation time, and adsorbent dosage on the adsorption of Cu(II) by activated carbon prepared from the biomaterial selected. The % adsorptions, Langmuir constants, Freundlich constant, Lagergren rate constants were determined for the adsorption system as a function of sorbate concentration. Equilibrium data were analyzed using the Langmuir and Freundlich isotherms whereas the adsorption kinetics data were evaluated by the pseudo-first-order kinetic model.

**Keywords:** Bio-adsorbent, Kinetics,

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**Estimation of Calcium, Potassium and Sodium contents in Leafy Vegetables of Maharashtra Region, India**

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**Abstract:**
Minerals are essential elements of the human diet, aiding in cellular body processes from rebuilding tissue to maintain ion gradients. Among the metal ions, sodium, potassium and calcium are the most important metal ions that exist in various food components. Leafy vegetables are important constituent of Indian food. Coriander, spinach, chavli, red spinach, methi, etc are routine food materials in daily diet. They are generally rich in metal ions.

Hence, this report presents a comparative study of the determination of calcium, potassium and sodium in a variety of leafy vegetable used in Maharashtra, India. These vegetables were obtained from local market and washed with distilled water several times. They were air-dried first and then in oven at 100°C to obtain in the form of powder. Each powder was extracted with 4:1 mixture of HNO\(_3\) and HClO\(_4\) to oxidize the organic matter and dissolve the sample. Each solution was made up to 100 mL and analyzed using flame photometry.

The instrument used was Elico CL-378 flame photometer provided with four filters for Li, Na, K and Ca. It is a microprocessor based instrument and works with a mixture of LPG as fuel and compressed air as oxidant.

The results obtained were subjected to analytical quality control and statistical analysis.

**Keywords:** Calcium, Potassium, Sodium, Flame photometry, Leafy vegetables.
Naturosomes improves bioavailability of standardized extract of Withania somnifera

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Abstract:

**Ethnopharmacological relevance:** Ashwagandha (Withania somnifera L. Dunal (WS)) has been used in Ayurvedic and indigenous medicine for very long time to treat various kinds of diseases and human ailments. The bioactive withanolides of WS have earlier been found to prevent acute stress-induced anxiety and chronic stress-induced depression in rats. However, the poor water solubility, poor permeability and bioavailability restrict the therapeutic efficacy of withanolides and current literature also lacks studies to improve their solubility.

**Aim of the study:** To improve the solubility and permeability of Standardized Extract of Withania somnifera (WS) by employing a phospholipid complexation (Naturosomes) based on Quality by Design (QbD) approach.

**Materials and Methods:** A solvent evaporation method was used to prepare the WS-Naturosomes (WN). The formulation and process variables were optimized using a central composite design. The formation of WN was confirmed by photomicroscopy, scanning electron microscopy (SEM), Fourier transform infrared spectroscopy (FTIR), Differential Scanning Calorimetry (DSC), and Powder X-ray Diffraction (PXRD). The saturation solubility, the in-vitro dissolution, and the ex-vivo permeability studies were used for the functional evaluation of the prepared complex.

**Results:** The prepared complex (WN) exhibited a significantly higher aqueous solubility compared to the pure WS, or the physical mixture of WS and the phospholipid. Similarly, the in-vitro dissolution revealed a significantly higher efficiency of the prepared complex (WN) in releasing the WS in comparison to the pure WS, or the physical mixture. The ex-vivo permeation studies showed that the prepared WN significantly improved the permeation of WS, compared to the pure WS, or the physical mixture.

**Conclusions:** WS-phospholipid complexation thus is a promising strategy for improvement of solubility of bioactive phytoconstituents of Withania somnifera to enhance its bioavailability and thereby its efficacy.

**Keywords:** Withania somnifera, Excipients, Phytoconstituents, Complexation, Solubility, Permeability
Synthesis and Characterization Nickel nano Spinel Ferrites by Microwave Sol-gel Auto combustion Method

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Abstract:
The inverse spinel nano crystalline pure and doped nickel nano spinel ferrites with generic formula NiCr$_x$Fe$_{2-x}$O$_4$ were synthesized by sol-gel auto combustion route. The synthesized nanopowder can be densified at a temperature 800 °C for 5 hours. X-ray diffraction results showed that the dried gels synthesized from metal nitrates and citric acid transformed directly into nano-sized ferrite particles after a combustion process in air. The XRD was used to confirm cubic, crystalline nickel ferrites. The scanning electron microscopy confirms nanosized, cubic nanoparticles of nickel ferrite, and their morphology was investigated and further confirmed nano sizes by TEM respectively. Magnetic properties viz. magnetic saturation and coercivity of the synthesized materials were characterized by VSM. The synthesized materials are useful in the application in high-density recording media.

Keywords: Nickel Nano ferrite, XRD, TEM, VSM, ferrimagnetic, sol-gel auto combustion.

References
Colour Fastness studies of 3-(p-substituted phenyl azo) -6-pyridone & its Derivatives

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Abstract:
The synthesis of series of 3-p-substituted phenyl azo -6-pyridone dyes which is suitable for the dyeing of polyester fabrics is described in this paper, visible absorption spectra of the dyes were examined in various solvents & the results are shown in table below:
The colour fastness studies of the titled dye is reported in this presentation:

Keywords: Pyridone, dispersed dye, polyester fastness

References:
1. www.dovepress.com

Physico-Chemical Analysis of Various Types of Soil Samples For Their Fertility Evaluation

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Abstract:
Soil analysis is an important diagnostic tool for determining the nutrient needs of plants and for environmental assessments. Thus, soil testing is widely accepted and used in most advanced crop production areas of the world to determine fertilization needs of crops. Various types of soils, namely fertile and non-fertile soils are available in the nearby environment.

In the present study, three soil samples were collected from cultivated field (fertile soil), non-cultivated field (non-fertile soil) and road-side area. Physical properties like particle size and water holding capacity were determined using standard methods. The chemical properties like pH, soluble salts, organic carbon, cation exchange capacity, calcium carbonate, calcium bicarbonate, available phosphorous, sulphur, nitrogen, etc were estimated using procedure adopted by National Bureau of Soil Survey and Land Use Planning.

The analysis could clearly help in understanding the texture and compositional differences in the various types of soil sample depending on their use. Also, it could be possible to suggest possible utility of these soils on the basis of their analysis.

Keywords: Physico-chemical parameters, Fertile soil, Non-fertile soil, Road-side soil.
Synthesis and Characterization of the Inclusion Complex of β-Cyclodextrin as a Host and Schiff Base of 1H-indole-2,3-dione as a Guest Molecule.

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Abstract:
Isatin, chemically recognized as 1H-Indole-2,3-dione, are known to be biologically active and synthetically versatile substances that are widely employed in organic and heterocyclic syntheses. The chemistry of Isatin and its derivatives viz. Imines (C=N) are particularly interesting because of their potential application in drug chemistry. These compounds are less soluble in aqueous medium which causes diminishing bio-functionalility. The bio-accessibility and stability of the synthesized Schiff’s bases can be enhanced by the preparation of their inclusion complexes with β-Cyclodextrin. The use of β – Cyclodextrin as host molecule for the encapsulation of Isatin Schiff’s base can protect the complex from environmental condition and improve the aqueous solubility.

In the present work, the guest molecule, Schiff bases of 1H-indole-2, 3-dione is encapsulated with β – Cyclodextrin. Inclusion complex with β-Cyclodextrin is analysed through physical and different spectral technique like UV-Visible, FT-IR, LC-MS. The encapsulation of Isatin Schiff’s base in the core of β - Cyclodextrin enhances its biological activity and solubility.

Keywords: Isatin Schiff’s base; β-Cyclodextrin; Inclusion complex; Enhances biological activity

*Presenting author

References:

Synthesis, Characterization and Antibacterial screening of Metal β-diketonates

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Abstract:
1-(2,4-dihydroxy-5-nitrophenyl)-3-(thiophen-2-y1)propane-1,3-dione (DNTPD) and its Calcium and Magnesium complexes have been synthesized. The β-diketone ligand is afforded by employing Baker-Venkataraman rearrangement on 4-hydroxy-5-nitro-2-(thiophen-2-yl) oxyacetophenone which was previously synthesized by p-nitroresacetophenone and thiophene-2-carboxylic acid. The synthesized compounds were characterized by their physical properties, elemental analysis, IR spectra, 1H-NMR, mass spectra and electronic spectra and the geometry of metal complexes have been concluded by magnetic spectra. The thermal stability of metal complexes has been studied by Thermogravimetric
analysis. The ligand and its transition metal complexes have been studied under pathogenic bacteria like Staphylococcus aureus, Bacillus subtilis, Proteus vulgaris, Escherichia coli and Proteus aeruginosa by filter paper disc diffusion method.

**Keywords:** β-diketones, Metal complexes, Baker-Venkataraman rearrangement, Thermogravimetric analysis, Antibacterial activity

**PP-40**

**Biological Assay of Pyrazolone Dyes & Derivatives**

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**Abstract:**
The synthesis of Pyrazolone & its derivatives have engrossed substantial attention from organic & medicinal chemists for many years as they belong to the class of the compounds with many versatile applications. It is used as a food colourant & pigmenting agent. Auxochrome groups present in its structure modifies the chromospheres, thereby resulting in maximum absorption of light. Despite possessing acidic & basic nature, acidic nature of pyrazolone & its derivatives always predominates. The biological assay of pyrazolone & its derivatives have been reported in this presentation.

**References:**

**PP-41**

**Determination of pK values of Various Types of Dyes using Spectrophotometric Method**

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**Abstract:**
Every dye that can be used as pH indicator is characterized by its pK value. The pK of indicator dye is used for its selection in various types of acid-base titrations. It is possible to determine the pK values of dyes using spectrophotometric methods. In the present study, various types of anionic, cationic as well as non-ionic dyes were studied for their pK values. The studies were carried out using spectrophotometer Equipronics EQ-824 with matched glass cuvettes of 10 mm pathlength. The dyes showed distinct colour change in the vicinity of the pK values. The absorption spectra were recorded and the pK was estimated using intersection method of absorbance values. The results obtained were compared with literature values.
Cyclic Voltammetric Studies of Reversible and Irreversible Redox Systems

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Abstract:
Cyclic voltammetry plays an important role in deciding reversible and irreversible nature of redox process taking place at the working electrode. In the present studies, various redox processes were studied using an Emstat 3+ potentiostat (Palmsens, Netherlands) model associated with Ag/AgCl reference electrode, platinum or graphite working electrode and platinum auxiliary electrode.
The effect of various parameters like supporting electrolytes, concentrations of supporting electrolytes, scan rate, type of working electrode, pH of supporting electrolyte etc were studied.
For the reversible redox systems, the graph peak current as a function of square root of scan rate was found to be linear passing through origin. Also, the ratio of forward and reverse peak current was found to be close to unity. For the irreversible systems, either there was no reverse peak or the above two criteria are not fulfilled.
Various organic compounds were found to undergo electropolimerization at electrode surface leading to increase in peak current in each successive scan.
Keywords: Adsorption, Cyclic voltammetry, redox process, platinum electrode, graphite electrode

Stability of Inclusion Complexes of Tribulin

Prachi P. Khobragade, J. S. Meshram

Abstract:
Tribulin Schiff bases having indole moiety are well known biological active agents. The compound was first obtained by Otto Linne Erdman and Auguste Laurent in 1840 as a product from the oxidation of indigo dye by the nitric acid and chromic acid. The bioaccessibility and stability of synthesized Schiff bases can be enhanced by the preparation of the inclusion complexes with BCD. The Schiff bases and their inclusion complexes are analysed through physical and different spectral techniques like UV Visible, FTIR, LCMS.
Keywords: BCD, Tribuline Schiff Bases, inclusion complexation

References:
Analytical Method Development and Validation of Lurasidone by RP-HPLC

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Abstract:
The present study describes the development of a validated RP-HPLC method for determination of Lurasidone drug. The separation was carried out at 40°C on a Princeton C18 (5μm, 250×4.6 mm) column with the Acetonitrile : Methanol (90:10 %v/v) as a mobile phase at a flow rate of 0.8 ml/min. The wavelength detection was at 210 nm. The retention time of nearly 3.5 minutes was obtained. Analytical validation parameters such as specificity and selectivity, linearity, accuracy and precision were evaluated. The calibration curve was linear in the range of 2–20 μg/ml with a correlation co-efficient of 0.999. Relative standard deviation values for all key parameters, was less than 2.0%. The method was validated according to ICH guidelines and the acceptance criteria for accuracy, precision, linearity, specificity and system suitability were met in all cases.

Keywords: Lurasidone, RP-HPLC, Analysis, Validation

References

Thermodynamic Stability via Lyapunov Function
Analysis of Industrial Chemical Processes

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Abstract:
The thermodynamic stability of the industrial sulphur trioxide synthesis using the framework of comprehensive thermodynamic theory of stability of irreversible processes (CTTSIP)1 has been investigated. The CTTSIP setup follows the basic steps of Lyapunov’s direct (second) method of stability of motion2. The desired Lyapunov function $\mathcal{L}_s$, of CTTSIP is the excess rate of entropy production whose time rate is determined in the perturbation space using the constitutive equations for the perturbation coordinate. The operative expression of $\mathcal{L}_s$ is obtained by Taylor expansion of it about the nonequilibrium state1. In view of the industrial setup the extended irreversible thermodynamic3 given
expression for the entropy production, $\Sigma_s$, is used to obtain the expression of $\mathcal{L}_\mathcal{S}$. Its time rate using the constitutive equations for the perturbation coordinates has been computed using Mathematica 11.0 software. These results have been plotted in the temperature degree of conversion space that generates the distinct regions of stability and instability. The earlier results of Fogler\(^4\) for temperature degree of conversion profile is compared with the present outcome that matches well. The conclusion is that one needs to pay a special attention to control the temperature at the initial part of the catalyst bed.

Keywords: Thermodynamic Stability, Theories of Stability

PP-46
Design, Synthesis and Molecular Docking of Flavonoids as COX-2 Inhibitor

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Abstract:
Inflammation is the complex biological response of vascular tissues to harmful stimuli, such as pathogens, damaged cells, or irritants. The important mechanism for anti-inflammatory activity is inhibition of eicosanoid generating enzymes including phospholipase A2, cyclooxygenases and lipoxygenases, thereby reducing the concentrations of prostanoids and leukotrienes. Other mechanisms include inhibition of histamine release, phosphodiesterase, protein kinases and activation of transcriptase. Present work was focused on synthesis of novel flavone and chalcone derivatives with substitutions on aromatic ring of chromone moiety. Flavone derivatives were synthesized from resorcinol to form 2, 4-diacetyresorcinol, this further gives formation of substituted chalcones with substituted benzaldehyde by Claisen Schmidt Condensation, substituted flavones were formed by oxidative cyclization in presence of DMSO/I\(_2\), after purification compounds were characterized by IR, \(^1\)HNMR, \(^13\)CNMR and Mass spectrometry. PIC\(_{50}\) was determined through molecular docking on COX-2 enzyme (PDB ID: 1CX2) by Schrodinger (Maestro 10.5v) software against celecoxib as standard. The docking analysis revealed that all compounds have shown good interactions with targeted enzymes. top-ranked flavonoids are \(3c (-5.274), 3b (-5.134), 3a (4.978)\) shown good interaction with HEM 600 and active amino acid residues of COX-2. The results may conclude that Flavonoids may serve as potential COX-2 Inhibitor in treatment of Inflammations.

Keywords: Flavonoids, COX-2, Molecular Docking, Inflammation.
PP-47

Synthesis and Characterization of BSA and ASA Sodium Salt Doped Polypyrrole

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Abstract:
Composite of the conducting polymer polypyrrole in Benzene sulfonic acid (PPY/BSA) and Anthraquinon-2-sulfuric acid sodium salt (PPY/ASA) were synthesized and characterized. The polymerization was process carried out in situ using ammonium persulfate (APS) as an oxidant. The particles were synthesized by varying the dopant concentration of benzene sulfuric acid and Anthraquinon sulfuric acid -2- sodium salt with (w/v) percentage concentrations.
In the present research work considerable effort have been made to modify the structure of polypyrrole by doping it with Benzene sulfuric acid (BSA) and Anthraquinon-2-sulfuric acid sodium salt (ASA) to study its dynamic electrical and mechanical properties. For this the polymer, polypyrrole was synthesized by chemical oxidation polymerization method. Undoped polypyrrole and with dopant PPY/BSA and PPY/ASA thin film synthesized with on glass slide surface using APS as an oxidant at room temperature by chemical bath deposition technique. Impact of dopant Benzene sulfuric corrosive and Anthraquinon-2-sulfuric acid sodium salt on properties of polypyrrole slight film was then examined. The synthesized SPPY, PPY/BSA and PPY/ASA sodium salt were characterized by Fourier transform infrared spectroscopy (FTIR), SEM analysis and XRD analysis. Surface morphology was influence by dopant, SEM analysis of PPY/BSA, PPY/ASA sodium salt image seems to be uniform micro porous on the surface and the particle. XRD analysis showed modification from fully amorphous to well developed crystalline structure after doping with BSA and ASA shows modification in structure. The conductivity of different molar ratios of doped polypyrrole was performed by a Kiethly 6571B High Resistance Meter and Electrometer using a four probe-setup.

Keywords: Pyrrole, ammonium peroxy disulphate, PPY/BSA and PPY/ASA sodium salt doped polypyrrole, chemical deposition method etc.
Synthesis and Characterization of Inclusion complex of Carbamide with extremely branched, globular, mono-disperse, nanometric Starburst PAMAM dendrimer

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Keywords: Inclusion complex, Dendrimer, polyamidoamine, Carbamide, Host-guest interaction
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Abstract:
Dendrimers are the emerging polymeric architectures known for their defined structure, low polydispersity, nanometric size and high functionality. These nanostructure macromolecules have shown their potential abilities in entrapping and conjugating the high molecular weight hydrophobic or hydrophilic entities by host-guest interaction and covalent bonding respectively. Dendrimer is the irresistible candidature for the formation of inclusion complexes capable of accomplishing the various applications. This is due to the presence of various terminal groups with varied functionalities. Herein, we have synthesized Polyamidoamine (PAMAM) dendrimer of various generations and characterized by Fourier transform infrared (FTIR) and Mass spectrophotometry. These synthesized dendrimers form the inclusion complexes with the carbamide molecule. In the formation of inclusion complex the hydrogen bonding is involved. The Hydrogen atoms present in carbamide forms the hydrogen bonds with the oxygen atom present in the dendrimer molecule as an ester linkage. Further the formation of inclusion complexes was characterized by the X-ray diffraction (XRD), SEM, Fourier transform infrared (FTIR) and UV-Visible spectrophotometry.

References:
A Review on: Carica Papaya Used As an Herbal Medicine in Dysmenorrhoea

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*Presenting author : * Priyanka Sawarkar.

Abstract:
Dysmenorrhoea have an impact on daily activities, school attendance, and limitations in social or functional activities; were absent in the class and were self-treated using analgesics 1-6 times per cycle (39.9%)1. Medicinal plants are an alternative treatment, which are increasingly in demand today and widely accepted in almost all countries around the world. Primary dysmenorrhoea occurs because of the excessive amount of prostaglandins in the blood1. Papaya leaf extract is considered to be able to reduce prostaglandin and menstrual pain1. Papaya (Carica papaya Linn) is commonly called as paw-paw and it belongs to the family Caricaceae. Carica Papaya leaves contain vitamin E acts as suppresser to the enzyme activity of phospholipase-A and cyclooxygenase by inhibiting of cyclooxygenase post-translational activation which reduce prostagandin production and increase the production of prostacyclin and PGE2 which function as vasodilators that can relax the uterine smooth muscle2. Papaya leaves contain flavonoids that have anti-inflammatory activity that can inhibit the enzyme cyclooxygenase I, which is the first path of pain mediation synthesis such as prostaglandin that affects the decrease in the intensity of menstrual pain3. Study stated that analgesic activity of papaya leaf extract is proportional to aspirin. Thus, this study aimed to examine the effect of Carica papaya leaf on menstrual pain and prostaglandin level in adolescent with primary dysmenorrhoea.

Keywords: Dysmenorrhoea, Carica papaya, Flavonoids, Prostaglandin, Analgesic activity, Cyclooxygenase.

References:
2. Ario Imandiri, Rohimatul Faizah, Rakhmawati, A survey on ethnomedicinal plants used for menstrual disorders in Kerala; Malaysian Journal of Medicine and Health Sciences (eISSN 2636-9346).
H-Beta Assisted Synthesis of 1-phenyl Naphthoic acids from α-arylidene β-Benzoyl Propionic Acid their Comparative Study

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Abstract:
On impending investigation, zeolites are used dehydrating agent in cyclization reaction. Zeolite H-Beta acts as a non-hygroscopic, non-volatile, odourless, inexpensive, readily available, reusable and an effective green catalyst. Synthesis of α-arylidene β-benzoyl propionic acid to 1-Phenyl Naphthoic acid via concentrated sulphuric acid, Poly phosphoric acid (PPA) and sulphamic acid (SA) are used as numerous cyclization catalysts. The zeolite H-beta is activated under autoclave moist heating at 1210°C at 15 lbs atm pressure. The reaction concoction of 1mmol of α-arylidene β-benzoyl propionic acid, 0.5 mmol activated H-Beta and 10 mmol industrial solvent are refluxed under gradual heating at optimize time. The reactions as above said are in attendance under microwave irradiation and followed by work-up process. The obtained blended mass are cool, dissolve in ether in subsequent fraction, collect organic layer and solidify in sodium sulphate to obtained 1-Phenyl Naphthoic acid and their subordinates. All the products are identified and characterized by FTIR 1HNMR, Mass spectroscopy.

Keywords: Zeolite H-Beta, green catalyst, α-arylidene β-benzoyl propionic acid, 1-Phenyl Naphthoic acid.

References:
Design, Synthesis and Biological Investigations of Pyrimidine Derivatives

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*Presenting author

Abstract: Condensation of 5-acetyl-7-amino-3-methyl-1,2-benzisoxazole 1 with aldehydes afforded 7-amino-3-methyl-5-(3'-aryl prop-2'-enoyl)-1,2-benzisoxazoles 2a-j. The reaction of 7-amino-3-methyl-5-(3'-aryl prop-2'-enoyl)-1,2-benzisoxazoles with urea produced 7-amino-3-methyl-5-(4'-aryl-2'-pyrimidin-6'-yl)-1,2-benzisoxazole derivatives 3a-j. Glucosylation of 3a-j with 2,3,4,6-tetra-O-acetyl glucopyranosyl bromide (TAGBr) and tetra butyl ammonium bromide (PTC) gives corresponding glucosylated 7-amino-3-methyl-5-(4'-aryl-2'-pyrimidin-6'-yl)-1,2-benzisoxazoles 4a-j. Glucosylated compounds 4a-j on deacetylation gives target products 7-amino-(β-D-glucopyranosyl)-3-methyl-5-(4'-aryl-2'-pyrimidin-6'-yl)-1,2-benzisoxazoles 5a-j. Glucosylation and deacetylation reactions carried out by Knenigs-Knorr reaction.

Synthesized products were characterized by IR,1HNMR,13CNMR, mass spectroscopy, elemental analysis and chemical properties. The biological and electrochemical activities of synthesized compounds were also examined.

Keywords: Benzisoxazole, Pyrimidine, Urea, N-Glucosides, Electrochemistry.

PP-52

Determination of Molecular Weight of Expanded Polystyrene in Different Solvents at 250 C and 350 C

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Abstract:
The molecular weight of polymer are varied from sample to sample. It is because of different chain length, nature, resistance and size of the polymer. The molecular weight of expanded polystyrene is found to be ~106 by Ostwald Viscosity method in different solvents at 250 C and 350 C. The molecular weight are almost constant for these two temperatures. The molecular weight of linear polystyrene is in the range of 150,000 to 500,000. A longer molecule, i.e. a molecule of higher molecular weight, shall have a greater number of temporary dipoles, and thus greater intermolecular attractions. The viscous flow properties of the polymer, as a function of temperature, are affected by its molecular weight and polydispersity. The slightly variation in molecular weight are due to viscosity which is affected by temperature. The intrinsic viscosity was calculated from the graph of ηsp/c and ln(ηr/c) verses concentration of polystyrene solution.
The Mark Houwink equation was used for calculation of average molecular weight of expanded polystyrene. From this study it is found that the average molecular weight for polystyrene in different solvents namely cyclohexane, chlorobenzene and 1,2- dichlorobenzene at 25\(^{0}\)C and 35\(^{0}\)C were found to be nearly same.

**Keywords:** Polystyrene, average molecular weight, Mark Houwink equation

**PP-53**

**Gamma Degradation Studies of High Density Chitosan Biopolymer**

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**Abstract:**

The term degradation indicates a reduction in the molecular weight of the polymer using some stimulants. These stimulants can be thermal activation, mechanical agitation or irradiation with ionizing radiations like high energy X-rays, Y-rays, UV-rays, microwave radiations, etc.). This study assessed the effect of gamma irradiation on molecular weight reduction of chitosan biopolymer and its possible applications. Chitosan (1-4-linked 2-amido-2-deoxy-\(\beta\)-D-Glucan) is a linear aminopolysaccharide obtained by partial deacetylation of chitin. Despite of its huge availability, properties and applications the usage of chitosan has been restricted by its high molecular weight and low solubility in aqueous solvent. So as to improve its solubility, degradation using gamma irradiation converting it into low molecular weight oligomers, which exhibit good water solubility. This gives it some unique properties from that of parent chitosan. Irradiation of chitosan was carried out using a 60\(^{0}\)C gamma source at doses of 5,10,20,50,100 kGy with a dose rate of 8.5 kGy/hr. FTIR and SEM study helped to identify main chemical changes noticeably occur in chitosan after degradation. The effect of irradiation on chitosan in terms of intrinsic viscosity and average molecules weight was measured using Ostwald capillary, Ubbelode capillary viscometry techniques and the results showed an remarkable reduction in molecular weight with irradiation doses up to 100 kGy. Comparative study of FTIR result reveals that, due to increase in irradiation doses, significantly decrease in MW is through the scission of glycosidic bonds without affecting its functional groups, while the degree of deacetylation was unaffected.

**Keywords:** Chitosan, gamma rays, Ostwald viscometer, Ubbelode capillary viscometer, degradation

*Presenting author*
PP-54

Nanobeads Ag (II) ChelatePolymer: Characterization, Antioxidant and Antibacterial Assay

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Abstract:
This article deals with preparative and structural studies of Ag(II)CP transition metal chelate polymer. The metal chelate polymer were synthesized from bis-ligand(N’N¹⁰bis(2-ethoxybenzolyl) decandiamide) with metal salt in dimethylformamide medium by condensation method and their structures have been authenticated by spectral analysis, FT-IR, X-ray, Raman UV-DRS,EDX,XPS analysis. XRD analysis reveals crystalline natures of metal polymeric complexes. Furthermore, morphological authentication was done by SEM and TEM. SEM reveals the nanobead woven in a thread like shape. TEM reveals the average particles sizes 10-50 nm. BET revealed mesoporous nature. After structural confirmation, the material was tested for antibacterial assay against human pathogenic bacteria such as E.coli, S.aeours, K.pneumoniae, B.subtilis. Antioxidant property of CP was examined by using α, α-diphenyl-β-picyrlyhydrazyl (DPPH) in ethanolic/methanolic solvents, while ascorbic acid was used as standard medium.

Keywords: Mesoporous Ag(II) chelate polymer; XPS; nanobeads ; antibacterial activity; Antioxidant activity

References:
3. J.Hassoun,; K.-S.Lee; Sun, Y.-K.; B.J.Scrosati, Am.Chem.Soc.(2011)133,3139

PP-55

Synthesis, Molecular Docking and Evaluation of Curcumin Derivatives as Anti-Inflammatory Agents

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*Presenting author : *Rina Ikhar

Abstract:
Curcumin is the natural polyphenolic yellow pigment, isolated from the rhizomes of Curcuma longa linn. Curcumin, it is a bis-α, β-unsaturated-β-diketone or differulomethane. There are multiple biological
activities of curcumin analogues in the treatment of various health disorders such as diabetes, neurodegenerative diseases, cardiovascular disorders and also used as anticancer, antioxidant, anti-inflammatory, antimicrobial agent. Structurally, curcumin derivative is 1,7-bis(4(substituted)benzoyloxy-3-methoxyphenyl)hepta-1,6-diene-3,5-dione. Computational method such as molecular docking is very useful and reasonably reliable for prediction of putative binding modes and affinities of ligands for macromolecules and will reduce the number of synthetic compound in drug discovery research. Molecular docking studies were done by using Schrodinger 11.5 software to evaluate affinity of synthesized compounds towards the COX-2 enzyme (PDB code: 5IKT) which is actively involved in inflammation. The docking analysis revealed that all compounds have shown good interactions with the targeted enzymes. In the present study, curcumin derivatives have been synthesized by Esterification of curcumin with substituted benzoyl chloride in presence of DMAP and structure were confirmed by infrared spectroscopy, ¹H NMR spectroscopy. The anti-inflammatory screening of synthesized compounds was carried out by carrageen induced rat paw edema method using plethysmometer. The compound 10c, 7c, 17c, 12c and 4c have shown good anti-inflammatory activity with highest docking score with -9.648, -9.492, -9.131, -8.522, -8.173. The results conclude that Curcumin derivatives may serve as potential for COX-2 inhibitor in treatment of inflammation.

**Keywords:** Curcumin derivatives, Molecular Docking, Anti-Inflammation.

**PP-56**

**Lemon juice as a natural and efficient catalyst for synthesis of oxadiazole derivative**

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**Abstract:**
We are here in reporting synthesis of oxa-diazeole derivative. Oxa-diazeole are the hetrocyclic compounds containing one oxygen& two nitrogen stoms in five membered ring. Lemon juice containing citric acid, as a natural acid catalyst for the synthesis of oxa-diazeole derivatives. This reaction proceed under natural acid lemon juice as a catalyst with the formation of product in good to high yield.

**Keywords:** lemon juice, oxadiazole derivatives

**Reference :**
2. https://www.sciencedirect.com
3. https://www.tandfonline.com
Synthesis and characterization of metallic sulfide NP doped graphene oxide for methylene blue adsorption to leuco methylene blue in aqueous mixture

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Abstract:
Oxidizing graphite (Gt) to graphene oxide (GO) through the non-explosive oxidizing mixture at 55°C is reported with high yield. GO was doped with NiS, ZnS, and CdS metallic sulfide nanoparticles (MSNPs) in a 1:1 ratio of GO to MSNPs respectively at 85°C. MSNPs were obtained by using chloride salts of Ni, Zn, and Cd metals with thiourea in a 1:3 ratio in aqueous GO for in situ doping. The GO and MSNPs doped GO (MSNPGO) were characterized by XRD, XPS, AFM, HR-TEM, FE-SEM, FTIR, UV-Vis spectrophotometry, Raman spectroscopy and thermogravimetric analysis (TGA). The GO, CdS-GO, NiS-GO, ZnS-GO had photocatalyzed methylene blue (MB) reduction by 88, 97.22, 79.68, and 89.87% to leuco MB (LMB) colorless, in aqueous mixtures respectively. Contrary to NiS-GO, the CdS and ZnS increased MB reduction by 9 and 1.87% respectively by weakening intersheet Vander Waals forces of GO for availing surface area. Ni2+ with 3d8 catalyzed 8.32% less MB to LMB than Zn2+ with 3d10 and Cd2+ with 4d10. MSNPs were uniformly doped with 2D GO sheets through a sulfide anion (S2-) releasing activity for a higher reduction from water and electronically active solvents. MSNP-GO-MB-LMB ventures a novel host-guest chemistry as the MB with sp2 along with sp2-sp3 hybridizations of GO are photocatalyzed to LMB. MSNP-GO-MB-LMB formulates a multifunctional nanocluster to absorb solar energy and heat contents due to MSNPs-GO interfaces. Likewise, ethylene (EB) and propylene blue (PB) could be separated through selective reductions as per their hydrophobicity.

Keywords: adsorption, Graphene oxide, Metal doped Graphene oxide, Methylene blue, metallic sulfide NP

*Presenting author: Sachin Dev

References:
Chitosan: A green, energy efficient, reusable, biodegradable catalyst for Biginelli reaction & for the synthesis of 4H pyrimido [2,1-b] benzothiazole-curcumin derivative and pyrimido thiazoles by Biginelli pathway.

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Abstract:
Biginelli is a multiple-component reaction, widely used for synthesis of dihydropyrimidones. Its basically a condensation pathway involve benzaldehyde, urea, ethylacetoacetate resulting dihydropyrimidones. This synthetic protocol is performed with a green, biopolymer chitosan (heterogeneous catalyst) used in aqueous medium (aqueous acetic acid 1-2 %) yields the products in shorter reaction time. Chitosan a polysaccharide that is widely distributed in living organism. Chitosan has been employed as a solid catalyst in reactions like Ulmann, Suzuki cross coupling, aldol and Knoevenagel reaction, thus the Biginelli reaction is carried out in the presence of chitosan in acetic acid for short reaction time. The fused heterocycles like 4H pyrimido [ 2, 1 b] benzothiazoles and thiazoles are synthesized by Biginelli reaction. The chitosan is employed for the same synthesis of these dihydropyrimidones, heterocycles, and their curcumin derivatives. The chitosan is found to be energy efficient and ecofriendly catalyst for the synthesis of these synthesis.

Keywords: chitosan, eco-friendly- catalyst, short reaction span, Biginelli reaction

References:
2. Haritma Chopra, Ankita Chaudhary, Ritu Gaba. 2018. The pharma innovation, Recent advances in the catalytic exploitation of chitosan based catalysts in organic transformations.
nanoparticles were clearly indicated by surface Plasmon resonance (SPR) band. Capping of nanoparticles with compounds in the plant extract was confirmed by Fourier transform – Infrared spectroscopy (FT-IR). Crystalline behaviors of nanoparticles were confirmed by XRD data and the SAED pattern. High Resolution Transmission Electron Microscopy (HRTEM) was used to study size and morphology of nanoparticles. Dynamic light scattering (DLS) method was used to know the hydrodynamic diameter of nanoparticles. The biosynthesized silver nanoparticles revealed potent antimicrobial activity.

**Key words:** Butea monosperma; green synthesis; Silver nanoparticles; Anti-bacterial; Anti-fungal

*S. S. Chourasia

**References:**

**PP-60**

**Protein :- An efficient (building block/ feedstock) Michael donor in Michael addition via Bioconjugation strategy**

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**Abstract:**
Bioconjugation is a chemical strategy to form a stable covalent link between two molecules, at least one of which is a biomolecule. The several functional groups in proteins and corresponding peptide makes it a good target via formation of covalent bond for a wide range of application. Here, Bioconjugation strategy is employed in Michael addition pathway where cysteine (from human hair) derived acts as Michael donor and reacts with some varied reagents (Michael acceptor) to give antimicrobial product. Bioconjugation also employed to simple addition of protein and certain fluorophores. The resultant product are having fluorescent property that is labeling of proteins, tracking cellular events and imaging specific biomarkers.

**Keywords:** Bioconjugation, Michael donor, protein, green chemistry, value added product, one pot synthesis

**References :**
3. governs its conservation and degeneration and restricts its utilization
Synthesis of Highly Dispersed Copper Nanoparticle Supported on Carbon

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\textsuperscript{*Presenting author: *Saniya kariya

Abstract:
Generation of new, novel, environmentally safe, heterogeneous catalyst by simple refluxing at constant thermal condition. Novel catalyst copper doped carbon shows detail view of deposition of copper nanoparticles on the surface of carbon doped mesoporous. The activated carbon was employed as support for the copper metal. Metal copper and carbon support has its significant contribution to maximum activity and reliable stability. Relevant properties of catalyst were investigates by XRD, Raman, BET, and TEM.

Keywords: Heterogeneous catalyst, doping, nanoparticles, mesoporous

References:

Effect of Food Additives on Thermo-Physical Properties of Myo-Inositol in Aqueous Amino Acid Solutions at Different Temperatures: Volumetric and Acoustic Approach

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\textsuperscript{4}Department of Biochemistry, Lady Amritabai Daga College, Nagpur Email Id-alkadhondge@gmail.com

Abstract:
Densities and speeds of sound of Myo-inositol (MI) in aqueous solution and 0.025, 0.050 and 0.075 mol · kg\textsuperscript{-1} aqueous solutions of glycine and valine have been measured at different temperatures $T = (288.15, 298.15 \text{ and } 308.15)$ K over the concentration range (0.01 to 0.1) mol · kg\textsuperscript{-1}. Density and speed of sound values were used to evaluate thermodynamic properties such as apparent molar volume $\left(V_{\phi}\right)$, isentropic compressibility $\left(k_{S}\right)$ of solution, apparent molar isentropic compressibility $\left(k_{\phi}\right)$ of solute, of myo-inositol in water and in aqueous solutions of glycine and valine. The limiting apparent molar expansivity
of solute and coefficient of thermal expansion \( (\alpha^s) \) of myo-inositol in aqueous binary and ternary solutions have also been computed. Limiting values of apparent molar volume \( (V^0_\phi) \) and apparent molar compressibility \( (k^0_\phi) \) were obtained from the plots \( V^\phi \) and \( k^\phi \) as a function of molality and have been utilized in obtaining transfer volumes \( (\Delta^\phi V^0_\phi) \) and transfer compressibilities \( (\Delta^\phi k^0_\phi) \) of myo-inositol from water to aqueous solutions of glycine and valine at different temperatures. The transfer volume \( (\Delta^\phi V^0_\phi) \) and transfer compressibility \( (\Delta^\phi k^0_\phi) \) at infinite dilution calculated from \( V^0_\phi \) and \( k^0_\phi \) were found to have positive values. The results are interpreted in terms of ion–ion, hydrophilic-ionic, ion-hydrophobic, electrostatic interactions and structure making/breaking ability of myo-inositol in aqueous glycine and valine solutions.

**Keywords:** Apparent molar volume, speed of sound, Viscosity B-coefficient, Hydration number, myo-inositol

*Santosh P. Jengathe

**References:**

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**PP-63**

**Chitosan-bentonite Composite as a Novel Sorbent for Removal of Brilliant Green Dye From Effluents**

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**Abstract:**
Brilliant Green has been reported as a dye molecule that persists in environment for long period and poses toxic effects in environment. The objective of this work is the study of adsorption of Brilliant Green dye solution using chitosan-bentonite composite (CBC). CBC were prepared by cross-linking reaction between chitosan and bentonite under acidic condition. CBC was characterized by Fourier Transform Infrared (FTIR) spectroscopy, scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDX) and X-ray diffraction (XRD) analysis. Batch adsorption studies were carried out by observing the effect of experimental parameters such as pH value, amount of adsorbent, contact time, concentration of adsorbate, pH point of zero charge, effect of temperature, etc. The optimized working conditions for the dye from aqueous solution were found to be pH 6.0, adsorbent dose 50 mg, contact time 30min, dye concentration 100 mg/L. The adsorption process was found to follow Langmuir isotherm model. The material was found to have excellent adsorption capacity towards Brilliant Green dye.

**Keywords:** chitosan, bentonite, brilliant green, adsorption, water treatment
Studies of Volumetric and Acoustic Properties of Myo-Inositol in Water and in Aqueous Solutions of Potassium Chloride and Magnesium Chloride at Different Temperature.

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Abstract:
Myo-inositol, is a carbocyclic sugar that is abundant in brain and other mammalian tissues, mediates cell signal transduction in response to a variety of hormones, neurotransmitters and growth factors and participates in osmoregulation. Densities and speeds of sound of myo-inositol in aqueous solution and in 0.06 mol · kg⁻¹ aqueous solutions of potassium chloride and magnesium chloride have been measured at different temperatures i.e. at \( T = (278.15 \text{ to } 318.15) \text{K} \) at an interval of 5K over the concentration range (0.01-0.2) mol · kg⁻¹. All the measurements were performed of the density and sound velocity meter Anton Paar DSA 5000M. The density \( (\rho) \) and speed of sound \( (u) \) were employed to calculate the various derived parameters such as apparent molar volume of solute \( (V_\phi) \), limiting apparent molar volume of solute \( (V_\phi^0) \), limiting apparent molar expansivity \( (E_\phi^0) \), thermal expansion coefficient \( (\alpha^*) \), second derivative of limiting apparent molar volume \( (\partial^2 V_\phi^0 / \partial T^2) \), isentropic compressibility \( (\kappa_s) \), partial molar isentropic compressibility \( (\kappa_\phi) \) and hydration number \( (\eta_h) \). The results obtained have been interpreted in terms of various interactions taking place among solute and solvent molecules.

Keywords: Density, Myo-inositol, Sound velocity, Apparent molar volume.

References (If any):

Compositional Comparison of Different Grades of Cements by Wet Chemical and XRF Analysis

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Abstract:
Portland cement is an important building material, mainly composed of calcareous material and argillaceous material. The calcareous material supplies lime include limestone, marl, chalk, etc. whereas argillaceous materials provide silica, iron and alumina are clay, shale, slate, etc. The variation in chemical constituent affects the cement properties like hardening, strength, colour, setting time, etc. Hence, it is necessary to analyse the Portland cement for its composition.

The common methods of analysis include wet chemical method and X-ray fluorescence. In the present work, the analysis of ordinary Portland cement was carried out for 43 grade, 53 grade and white cement samples. The chemical composition of cement was determined with different classical analytical methods, which includes gravimetric as well as titrimetric methods of analysis. A comparison between each cement type indicated variation in chemical composition existing between them. Sodium and potassium content were estimated using flame photometry technique.

From the results, it was observed that cement containing no iron or very less amount of iron and high amount of calcium oxide is responsible for white appearance of the cement. The results obtained by wet chemical methods were compared with those obtained by XRF analysis.

Keywords: 43 grade cement, 53 grade cement, white cement, gravimetry, titrimetry, XRF.

Synthesis, Characterization and Some Application Studies of a Terpolymer 4-Hydroxybenzoic Acid-Thiourea-Formaldehyde

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Abstract:
A terpolymer Salicylic acid-Thiourea-Formaldehyde has been synthesised by microwave irradiation at 300W and characterization of the polymer has been done with the aid of elemental analysis, FTIR and NMR spectral analyses. The reaction time and yield of the polymer has also been compared with that of classical method of synthesis. Chelation ion exchange properties of the terpolymer has been studied for Cu2+, Zn2+, Pb2+ and Fe3+ metal ions and their respective distribution ratios have been calculated. Thermal degradation kinetics of the terpolymer has also been studied under non-isothermal conditions.

Keywords: Microwave, Terpolymer, Chelation, Ion-exchange, FTIR, NMR

*Presenting author

References:
**PP-67**

**Spectrophotometric Method For Determination Of Diacerein And Glucosamine Sulphate In Pharmaceutical Formulation**

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**Abstract:**
A simple, sensitive, rapid, accurate and precise spectrophotometric method has been developed for the estimation of Diacerein and Glucosamine Sulphate in bulk and pharmaceutical dosage forms. Diacerein shows maximum absorbance at 342 nm and Glucosamine Sulphate at 257 nm. Beer’s law was obeyed in the concentration range of Diacerein at 1-50 µg/ml and Glucosamine Sulphate at 1-60 µg/ml. The method was found to be precise, accurate and specific. The proposed method was successfully applied to estimation of Diacerein and Glucosamine Sulphate in combined dosage form. The method was validated according to ICH guidelines.

**Keywords:** Diacerein, Glucosamine sulphate, UV spectroscopy.

**References**:

**PP-68**

**Thermodynamic Studies on Molecular Interactions between Ampyrone and β-Cyclodextrin in Water**

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*Presenting author : *S. S. Pawde

**Abstract:**
Present work reports the study of interactions of anti-inflammatory drug Ampyrone with β-cyclodextrin in water at different temperatures thorough thermodynamic properties. For this the density and ultrasonic velocity of solutions were measured and used to calculate the apparent molar volumes and apparent molar isentropic compressibilities. The partial molar volumes and isentropic compressibilities with respective standard transfer properties have been determined. The dominating lateral interactions namely hydrophilic-hydrophilic and hydrogen bonding interactions over the hydrophobic-hydrophobic interactions (inclusion complex) have been observed.

**Keywords:** Drug carrier, molecular interactions, thermodynamic properties

**References**
Effect of Temperature on Volumetric and Acoustic Properties of Creatinine Hydrochloride in aqueous Sodium and Potassium Chloride Solutions

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Abstract:
Creatinine itself is a product via a biological system involving creatine, phosphocreatine which is also known as creatine phosphate. Creatine is synthesized primarily in liver from the methylation of glycocayamine synthesized in the kidney from the amino acids, arginine and Glycine by S-adenosyl methionine.1,2 A systematic measurements of density and speed of sound of Creatinine hydrochloride in aqueous and in aqueous solutions of 0.06 mol∙kg⁻¹ NaCl/KCl and 0.1 mol∙kg⁻¹ NaCl/KCl were carried out at T = (288.15-318.15) K within the concentration range of (0.01 to 0.1) mol∙kg⁻¹. All the measurements were performed of the density and speed of sound simultaneously on Anton Paar DSA 5000M. The density (ρ) and speed of sound (u) were employed to calculate the various derived parameters such as apparent molar volume of solute (V_ϕ), limiting apparent molar volume of solute (V_ϕ⁰), limiting apparent molar expansivity (E_ϕ⁰), thermal expansion coefficient (α_ϕ), second derivative of limiting apparent molar volume (d²V_ϕ⁰/dT²), isentropic compressibility (κ_s), partial molar isentropic compressibility (κ_ϕ) and hydration number (η_H). The trends of variation of experimental and computed parameters have been discussed in terms of hydrophilic-ionic group and hydrophilic-hydrophobic interactions operative in the systems.

Keywords: Density, Creatinine Hydrochloride, Sound velocity, Apparent molar volume.

*Sneha Bankar

References:
PP-70

Analytical method development and validation of Saroglitazar by RP-HPLC

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Abstract:
The present study describes the development of a validated RP-HPLC method for determination of Saroglitazar in presence of its degradation products or other pharmaceutical excipients. Stress studies were performed and it was found that it degrades in acidic and alkaline conditions. The separation was carried out at 40°C on a Princeton C18 (5 µg, 250×4.6 mm) column with the 30mM Ammonium acetate: Acetonitrile (40:60 %v/v) as a mobile phase at a flow rate of 0.5ml/min. The wavelength detection was 294 nm. The retention time of nearly 9.5 minutes was obtained. Analytical validation parameters such as specificity and selectivity, linearity, accuracy and precision were evaluated. The calibration curve was linear in the range of 2–20 µg/ml with a correlation co-efficient 0.9994. Relative standard deviation values for all key parameters, was less than 2.0%. The method was validated according to ICH guidelines and the acceptance criteria for accuracy, precision, linearity, specificity and system suitability were met in all cases.

Keywords: Saroglitazar, RP-HPLC, Analysis, Validation.

References:

PP-71

Volumetric and Transport Behavior of Dopamine Hydrochloride in Aqueous Solutions at Different Temperatures

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Abstract:

Sudip Mondal*
In this communication we report apparent molar volume of solute \( V^\Phi \), limiting apparent molar volume of solute \( V^0 \), limiting apparent molar expansivity of solute \( E^\Phi^0 \), thermal expansion coefficient \( \alpha^* \), Helper constant \( \partial^2 V^0 / \partial T^2 \), Jones–Dole equation viscosity A and B coefficients, temperature derivative of B coefficient i.e., \( dB / dT \) and hydration number \( n_H \) for aqueous solutions of Dopamine Hydrochloride. The above parameters have been obtained from measured values of densities \( \rho \) and absolute viscosities \( \eta \) for aqueous binary mixtures of Dopamine Hydrochloride and water in the concentration range \((0.01 \text{ – } 0.1) \text{ mol \cdot kg}^{-1}\) as a function of temperature at \( T / K = (288.15, 298.15 \text{ and } 308.15) \) and at atmospheric pressure. The results obtained were interpreted in terms of structure making and structure breaking abilities of the solute in aqueous solution.

**Keywords:** Density; Viscosity; Dopamine Hydrochloride; Apparent molar volume of transfer.

**References:**
**PP-73**

“No-fine” concrete for ground water recharging

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**Abstract:**

Pervious concrete is a zero-slump, open graded material consisting of hydraulic cement, coarse aggregate, admixtures and water. Because pervious concrete contains little or no fine aggregate such as sand, it is sometimes referred to as “no-fine” concrete. It is a special type of concrete having high void content of about 30% is becoming popular nowadays due to its potential to reduce the runoff to the drainage systems which can provide a flow rate around 0.34 cm/second.

Pervious concrete has a large open pore structure hence less heat storage and faster. It has effective application in low loading intensity parking pavements, foot paths, walkways and highways. It is considered as an environmental protection agency (EPA) for providing pollution control, storm management and suitable development. Here, pervious concrete mix is designed with little sand, cement and aggregate.

The aim of this project is to lay the pervious concrete in platform and car parking thus transmitting the water to the underground surface very easily for maintaining the ground water level in all the places.

**Keywords:** Zero slump concrete, Fly ash, Coarse aggregate.

**PP-74**

In Silico Designing of biologically active coumarin derivatives

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**Abstract:**

Inflammation is the body’s immediate response to damage to its tissues and cells by pathogens, noxious stimuli such as chemicals, or physical injury. Acute inflammation is a short-term response that usually results in healing: leukocytes infiltrate the damaged region, removing the stimulus and repairing the tissue. Such persistent inflammation is associated with many chronic human conditions and diseases, including allergy, atherosclerosis, cancer, arthritis and autoimmune diseases. To overcome the challenges of inflammatory disorders, several classes of anti-inflammatory drugs have been used. Coumarin ring composed of Benzene ring fused with pyrone ring.2H-chromen-2-one (1,2-benzopyrone, or 2H-1-benzopyran-2-one) oxa-heterocycle Coumarins can be synthesised by methods such as Claisen rearrangement, Perkin reaction, Pechmann reaction, Knoevenagel condensation. Coumarin have been
considered for a variety of biological activities such as anticoagulant, anti-inflammatory, antimicrobial,anticancer, antiviral and antioxidant activities. The main objective of molecular docking is to predict the biological activity of given ligand. The Molecular Docking study was done by using Maestro 11.5 Schrodinger software to find the interaction between active Coumarin derivatives with COX2 enzyme (PDB ID: 1cx2). Molecular docking studies showed that Novel Coumarin derivatives has shown formation of hydrogen bond and good binding affinity with some amino acid residues. Hence Coumarin derivatives may inhibit the activity of enzyme COX2 binding at its active site. The compounds (01, 03, 13)) were showed potent against the COX2 compared with standard Diclofenac. On the basis of docking result Coumarin may be good Antiinflammatory agents.

Keywords: Coumarin, COX2, Molecular docking, Anti-inflammatory, Dichlofenac

PP-75

Synthesis and Thermal Studies of Chelate Polymers of Bis Ligands

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Abstract:
Chelate polymer has attention due to promise of generating material with specific properties based on chosen building blocks. Polymers are important materials for use in commodity products such as textiles, tires, and packaging. Polymers, particularly thermosets, also have widespread use as composite materials in transportation, including automotive, marine, and aerospace. Most of these markets are now mature and future growth is expected to be small; however, there are many more application for polymers that may be less obvious but have great potential and offer challenges for new technology and growth into the twenty-first century. This communication describes the synthesis and characterization of chelate polymers of Mn(II), Co(II), Ni(II) and Zn(II) with azelaoyl bis-N-tolyl hydroxamic acid [1-6]. The recrystallized ligand was structurally elucidated on the basis of elemental analysis, IR, NMR and UV visible studies. Four metals chelate polymers were synthesized and characterized on the basis of elemental analyses, reflectance spectra and magnetic susceptibility data, FTIR, X-RD, SEM, TGA and DSC [2-4]. The nature of bonding has been further discussed on the basis of infrared spectral data. The water of hydration as well as water of coordination has been ascertained on the basis of thermal analyses [5].

Keywords: chelate polymers, ligand, polymer

References:
PP-76

Functionalize Metal-Organic Material for Biological Applications

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Abstract:
A summary of recent work is describing the synthesis and characterization of metal cluster compounds. The complexes were synthesized by template method in which organic ligand as building blocks, has been assemble the transition metal ion through coordinate bonds. The complexes were prepared without using a catalyst, toxic solvent, surfactant and complicated equipment’s; which makes it one step, simple, efficient and environment friendly. The chemical structure of metal complexes is studied by various physical methods such as UV-Visible, magnetic susceptibility, molar conductance, FTIR, Elemental analysis, H\(^1\) NMR and LC-MS. To investigate the applications of the synthesized complexes, in the next step the complexes were screened for antimicrobial activity against clinically important bacteria such as E. coli, P. vulgaris, S. staphylococcus and B. subtilis. In vitro antioxidant activities of these compounds are evaluated against hydrogen peroxide and compared with the standard natural antioxidant, vitamin C. Also, the electrical and magnetic response were evaluated which is found to depend on the molecular structure of the complex as well as the ionic potential of the metal ions.

Keywords: Salicylidene metal complex, template method, antibacterial activity, antioxidant activity

References:
PP-77


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Abstract:
The study is aimed at synthesis of different generations (-0.5G, 0.0G, +0.5G) of polyamidoamine (PAMAM) dendrimers. The dendrimers were then complexed with Iron(II) metal. All the synthesized complexes were characterised by FTIR and U.V- Visible spectroscopy. Further, the Thermo Gravimetric Analysis (TGA) and other physical parameters were studied for the synthesised complexes.

Keywords: polyamidoamine (PAMAM) dendrimers, Iron(II) complexes
* Anjali D. Gurnule

PP-78

WO3@GO Nanocomposites as an Effective and Reusable Catalyst for Degradation of Toxic Organic Pollutants

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Abstract:
In this work, we have reported a facile approaches to prepare a uniform Tungsten Oxide nanoparticles-graphene oxide nanosheets (WO3@GO). A one-step solvothermal method featuring the reduction of graphene oxide and formation of WO3 nanoparticles (WO3 NPs) was green, efficient, scalable, and controllable. The composite nanosheets was characterized by X-ray diffraction (XRD), transmission electron microscopy (TEM), and X-ray photoelectron spectroscopy (XPS) which demonstrated WO3 NPs with a diameter of approximately 30-50 nm were densely and compactly deposited on Graphene Oxide Nanosheets. To investigate the formation mechanism of WO3@GO, we discussed in detail the effects of a series of experimental parameters, including the concentrations of the precursor, precipitation agent, stabilizer agent, and graphene oxide on the size and morphology of the resulting products. The degradation of different dye in aqueous solution. A high degradation efficiency was achieved at the experimental conditions of 100 mg/L for dyes, 100 mg/L WO3@GO, at 25 °C temperature. Moreover, WO3@GO showed an excellent reusability and stability. The effects of various operational parameters
including pollutant type, solution pH, catalyst dosage, pollutant concentration, temperature, and inorganic anions on the catalytic degradation process were comprehensively investigated and elucidated. The further mechanistic study revealed the redox couple on WO₃@GO played the dominant role in dye degradation, where both hydroxyl and sulfate radicals were generated and proceeded the degradation of pollutants.

**Keywords:** WO₃@GO Nanocomposites, X-ray photoelectron spectroscopy, Stabilizer agent, Organic Pollutants

**References**


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**PP-79**

**Formulation And Validation Of Disinfectant Solution Containing Hydrogen Peroxide With Silver Nanoparticle**

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**Abstract:**
A colorimetric hydrogen peroxide sensor based on localized surface plasmon resonance of polyvinyl alcohol capped silver nanoparticles is introduced. Silver nanoparticles were synthesized by chemical reduction. For any practical application of the silver nanoparticles it is necessary to stabilize it which can be done by making a composite. In present studies polymers were chosen such that AgNP could be put to some practical uses. Polyvinyl alcohol (PVA) are important for use in textile, electronics and food/drug technologies respectively. Polymeric composites of PVA were prepared by mixing the aqueous solutions of the respectively polymer and the colloidal suspension of per-formed silver nanoparticles. Various compositions containing 1% to 5% of Ag nanoparticles were prepared. These nanoparticles are characterized using UV-vis spectroscopy, scanning electron microscopy and X-ray diffraction. As a result, yellow colour of the silver nanoparticles- polymer solution was gradually changed to transparent colour. Furthermore, when this transparent solution was subjected to thermal treatment, it becomes again yellow and the UV-Vis spectroscopy confirmed that nanoparticles were again formed.

**Keywords:** hydrogen peroxide sensor, silver nanoparticles, polyvinyl alcohol (PVA), UV-vis spectroscopy, scanning electron microscopy and X-ray diffraction

**References:**

Copper Oxide Encapsulated Mesoporous Alumina for Removal of Multipollutants from Water

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Abstract:
Water crisis is a big issue of 21st century. Presence of multipollutant in water makes water unfit for various purposes, and exhibit adverse effect on environment and human health. Simultaneous removal of these pollutants of varied nature and unparallel chemistry is a challenging task. Among all the existing technologies, adsorption seems to be the most appropriate cost effective technology. The present work deals with preparation and evaluation of a novel adsorbent namely Copper Oxide Encapsulated Mesoporous Alumina (COEMA) for removal of multi toxic elements of varied chemical nature including As, Cr, F and PO₄³⁻. The material was thoroughly characterized for various physico-chemical and morphological properties using powder X-ray diffraction (PXRD), Fourier Transformation Infrared (FTIR) spectroscopy, Scanning Electron Microscope (SEM) etc. The material was evaluated for removal of multipollutant namely As, Cr, F and PO₄³⁻ using batch adsorption studies and effect of different parameters like adsorbent dose, pH and presence of co-ions was studied. The adsorption data was fitted to Langmuir and Freundlich adsorption models to determine the adsorption capacity and delineate the adsorption mechanism. The material exhibit excellent (>90%) removal efficiency for all the pollutants and was found to be efficient in wide range of pH. It was also observed that several interfering ions such as SO₄²⁻, NO₃⁻, CO₃²⁻ and HCO₃⁻ have marginal affect on removal efficiency for the toxic pollutants. The study has confirmed that COEMA proves to be a highly potential adsorbent for removal of multipollutant from water and waste water.

Additional Co-authors - ShatabdiKaware, SunitaUike

Keywords: Arsenic, Fluoride, Chromium, Phosphate, Copper Oxide, Mesoporous Alumina

*Rashmi Dahake

References:
Highly Efficient Arsenic Removal using Industrial Wastes

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Abstract:
Arsenic contamination in groundwater has emerged as an important environmental issue since it poses significant health risk. Dangerous arsenic levels in natural waters often referred to as a twentieth-twenty-first century calamity. According to most recent estimates arsenic contamination has been reported from about 105 countries affecting more than 226 million people worldwide. In India, the situation is worst as more than 1000 villages in West Bengal are affected with arsenic contaminated drinking water. Compared with As(V), As (III) is more toxic and mobile and more difficult to remove with a maximum permissible concentration of 10μgL⁻¹. Among several arsenic removal technologies, adsorption is considered as most feasible option due to ease of operation, low energy requirement, generation of less sludge and user friendliness.

In the present study sludge obtained from the TiO₂ manufacturing industry was used as an adsorbent and evaluated in batch adsorption process for removal of arsenic. As received iron rich sludge was methodically cleaned and was thoroughly characterized for various structural, physio-chemical and morphological properties using powder-XRD, SEM and FTIR. The parameters governing adsorption efficiency like dose, kinetics, effect of solution pH and initial arsenic concentration were also investigated in laboratory experiments. The adsorption mechanism was further investigated by using Langmuir and Freundlich adsorption isotherms and various kinetic models. The adsorbent exhibit very high removal efficiency for arsenic (> 97%). Fe based sludge can be considered as an effective potential point-of-use material for mitigating arsenic contaminated groundwater.

Additional Co-authors: KetkiNagpure, VyankateshMohadikar

Keywords: Arsenic, TiO₂, Iron, adsorption

References (If any):
1Green synthesis of α-Fe2O₃ nanoparticles for arsenic(V) remediation with a novel aspect for sludge managementDebaratiMukherjee, SourjaGhosh, SwachchhaMajumdar, K. Annapurna, Journal of Environmental Chemical Engineering, Vol 4, Issue 1, March 2016, Pages 639-650
2Recyclable high-affinity arsenate sorbents based on porous Fe2O3/La2O2CO3 composites derived from Fe-La-C frameworks, Jiang-BoHuo, KiranGupta, ChangyongLu, Hans Chr.Bruun Hansen, Ming-LaiFu, Colloids and Surfaces A: Physicochemical and Engineering Aspects, Vol 585, 20 January 2020, 124018
Luminescence Properties of Dy$^{3+}$ doped SrZn$_2$(PO$_4$)$_2$ Phosphor

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Abstract:
We report, luminescence properties of Dy$^{3+}$ doped SrZn$_2$(PO$_4$)$_2$ phosphor synthesized by WET Chemical method. Prepared samples were characterized by XRD, FT-IR, Photoluminescence and Thermoluminescence techniques. Photoluminescence properties of SrZn$_2$(PO$_4$)$_2$:Dy$^{3+}$ phosphors showed a 480nm and 572nm emission. These are ascribed to $^4$F$_{9/2}$$\rightarrow$$^6$H$_{15/2}$ and $^4$F$_{9/2}$$\rightarrow$$^6$H$_{13/2}$ transition of Dy$^{3+}$ ions under excitation at 324, 350, 366 and 388 nm in the near-UV region. These blue and yellow emissions are supported for white light generation for LED lighting. The synthesized phosphor was irradiated with a $^{60}$Co-γ (gamma) source at a dose rate of 6.34kGy/h. Thermoluminescence (TL) studies of these Dy$^{3+}$-doped SrZn$_2$(PO$_4$)$_2$ phosphors were performed using a Nucleonix TL 1009I TL reader. Trapping parameters of this phosphor such as activation energy (E), order of kinetics (b) and frequency factor (s) were also calculated.

Keywords: WET Chemical method; Eu$^{3+}$ ions; Luminescence; Gamma rays

Presenting authors
Priyanka S. Jagnade*

PP-83

Luminescence Properties of Eu$^{3+}$ doped Ca$_2$SrAl$_2$O$_6$ Phosphor synthesized by WET Chemical Method

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Abstract:
In the present work, Eu$^{3+}$ doped Ca$_2$SrAl$_2$O$_6$ phosphor successfully synthesized by WET Chemical Method are reported. The crystal structure, phase formation of prepared phosphor was characterized by X-ray Diffraction pattern and Fourier Transformed Infrared Technique. Luminescence properties of synthesized phosphors were characterized by photoluminescence (PL) and thermoluminescence (TL) techniques. Under 394nm and 466nm excitation, all the powder samples of Ca$_2$SrAl$_2$O$_6$:Eu$^{3+}$ show bright orange and red emission around 591nm and 615nm, respectively. In the present study, orange color (591nm) emission due to $^5$D$_0$$\rightarrow$$^7$F$_1$ transition and red color (615nm) emission is due to $^5$D$_0$$\rightarrow$$^7$F$_2$ transition of Eu$^{3+}$ ions. The highest photoluminescence intensity observed at 615 nm, which was found at a content of about 1 mol% Eu$^{3+}$. Commission Internationale de l'Eclairage co-ordinate (CIE) of this phosphor is found in the red region. The synthesized phosphor was irradiated with a $^{60}$Co-γ (gamma) source at a dose rate of 6.34kGy/h. TL glow curves were recorded for different doses of gamma ray exposure at a heating rate of 5°Cs$^{-1}$. The kinetic parameters such as activation energy “E”, the order of kinetics “b”, and the
frequency factor “s” of Ca$_2$SrAl$_2$O$_6$:Eu$^{3+}$ are also calculated. The present phosphor acts as a single host for red emission display devices and light emitting diode (LED) as well as may be used for thermoluminescence dosimetric material under UV exposure. All these results of synthesized phosphor show that this phosphor can also be utilized for lighting application and dosimetric purpose.

**Keywords:** phosphor; luminescence; wet chemical synthesis

Presenting authors

Syali M. Turkar*

PP-84

**Uv Spectrophotometric Method For Simultaneous Estimation of Esomeprazole And Domperidone In Bulk And In Pharmaceutical Formulation**

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**Abstract:**

A novel, simple, sensitive and rapid spectrophotometric method has been developed for simultaneous estimation of esomeprazole and domperidone in pharmaceutical dosage form. This method was based on UV spectrophotometric determination of two drugs, using simultaneous equation method. The method involved solving simultaneous equations based on measurement of absorbance at two different wavelengths 301 nm and 287 nm, of esomeprazole and domperidone respectively. Beer’s law was obeyed in the concentration range of 2-20 µg/ml and 2-20 µg/ml for esomeprazole and domperidone respectively. The method showed good reproducibility and recovery with % RSD. The method was found to precise, accurate, and specific. The proposed method was successfully applied to estimation of esomeprazole and domperidone in combined dosage form. The method was validated according to ICH guidelines.

**Keywords:** Esomeprazole, domperidone, λ max, Spectrophotometric method, ICH guideline

**References:**


Simultaneous Estimation of Metformin Hydrochloride and Glimepiride By Uv-Visible Spectroscopy
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Abstract:
The simple, accurate, economical and reproducible spectrophotometric methods for simultaneous estimation of two-component drug mixture of Metformin hydrochloride and Glimepiride in bulk drug and pharmaceutical preparations have been developed. Developed methods are based on direct estimation of Metformin hydrochloride at 237 nm and Glimepiride at 228 nm. For estimation first developed method involves formation and solving of simultaneous equation. The developed methods obey Beer’s law in the concentration ranges 2-50µg/ml for Metformin hydrochloride and 2-50µg/ml for Glimepiride. The method validated according to ICH guidelines in respect of precision, accuracy, sensitivity and linearity.

Keywords: Simultaneous Spectrophotometric Analysis, Metformin hydrochloride, Glimepiride

References:

Status and challenges of solid waste generation of Nagpur city
Pravin U. Meshram1*, Vaishali Meshram2, P. R. Sakhare3, M. G. Thakre4

ABSTRACT
Solid waste management is a global environmental issue which concern about both economical and environmental problem. Nagpur is emerging as a mega city with a population of 45 million is beset with problems of urban influx, inadequate infrastructure and management. Nagpur city being a densely populated with rapid growth of urbanization industrialization and wide spheres of human activities facing these problems immensely. The present municipal solid waste generation in Nagpur city is approximately 800 metric tones/day. NMC has taken all initiatives to follow the compliance as per the municipal solid waste (Management & Handling) rules 2000. Generally open dumping of solid waste is practiced in most of the urban parts of city. However, still the deficiencies are observed in the proper planning of solid waste management which needs to be accounted for corrective measures. In this paper, an attempt is made to evaluate the major parameters of MSWM, in addition to a comprehensive review of MSW generation, its characterization and treatment options as practiced. It is for this reason it was thought worthwhile to carry out a systemic study of solid waste characterization and generation and if possible preventive measures for its control with few recommendation.

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