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One Day National Seminar on

Advanced Perspectives and Concepts in Chemical Sciences

Organized By

M.G. Science Institute

Dada Saheb Maviankar Campus, Opposite Gujarat University, Navrangpura, University Area, Ahmedabad, Gujarat, India



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**One Day National Seminar on
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26th February 2018**

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Department of Chemistry, M. G. Science Institute, Navarangpura,
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Energy-dispersive X-ray Fluorescence method for Determination of Gold and Silver in Jewellery

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ABSTRACT

For refiners, recyclers, and analytical assay labs alike, the price of gold and silver in today's market requires information that is delivered quickly, as well as with high accuracy. X-ray fluorescence (XRF) analyzers present a cost-effective, efficient, accurate and precise solution, and offer a number of unique benefits like measurement times ranging from 2 to 15 seconds; 100 % non-destructive analysis; complete alloy composition, simultaneous multi-element analysis; easy-to-use; does not require a highly-skilled operator. A highly economical tool compared to the cost of fire assay. While not a total replacement for fire assay for most gold refiners, an XRF analyzer can significantly increase speed and efficiency in a gold and silver recycling or refining facility. The results from a study signify the real scope of energy dispersive XRF in the analysis of precious metal samples prior to their hallmarking are presented. The advantages and limitations of this technique are reported for the analysis of gold and silver jewellery samples, which is one of the most significant industrial activities in Ahmedabad. The results of gold and silver support the use of this technique in Assay Offices, not only for screening purposes, but also as an alternative to cupellation and potentiometric titration for a number of samples. The application of the energy-dispersive XRF spectrometer for the detection of plating layers like rhodium and nickel is also discussed.

Spectrophotometric Methods for the Determination of Benzoyl Peroxide from the Wheat Flour Sample

Jay R. Dave

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ABSTRACT

New spectrophotometric method for the determine Benzoyl peroxide from the wheat flour was developed recently. The detection principle was based on the reaction between Benzoyl peroxide & potassium iodide in alcoholic medium. Here in this reaction potassium iodide oxidized by Benzoyl peroxide, it generates coloured iodine. There was maximum absorption peak in 580 nm wavelenghth. Potassium iodide system determine Benzoyl peroxide(Result).Wheat flour dissolved in ethanol by extraction of ethanol & centrifugal of Benzoyl peroxide. Under the selected conditions, the linear range for quantification of Benzoyl peroxide was observed between 10 mg/L to 50 mg/L . The limit of detection (LOD) was 30 mg/L. The developed method obtained superior precision using 10 repeatability. The proposed methodology was successfully applied to determine Benzoyl peroxide in wheat flour samples. Other methods for the detection is based on Benzoyl peroxide reacted with 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) to obtain a blue-green colored product that was detected at 415 nm by spectrophotometry. To determine benzoyl peroxide content in wheat flour and flour products based on spectrophotometry. In phosphoric acid medium potassium iodide oxidized by benzoyl peroxide oxidation then generated colored iodine and starch there was maximum absorption peak in 585 nm wavelength there by the starch potassium iodide system spectrophotometry was established to determine benzoyl peroxide.

Physico-Chemical Analysis of Selected Ground Water Samples of Umarala And Talaja Talukas of Bhavnagar District, Gujarat, India

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ABSTRACT

This study is aim to assess the quality of groundwater of Umarala and Talaja talukas of Bhavnagar district. In southern part of Gujarat state. Samples were tested from Jan.-Feb.2015. The test such as temperature, pH, EC, TDS, Alkalinity, Calcium, Magnesium, Sulphate, Chloride etc.. The water samples are from bore wells carried out in a polythene bottles from five samples of each talukas of Bhavnagar district, Gujarat State. The results were compared with standards prescribed by WHO and ISI 10500-91.

Keywords : Physico-chemical parameters, TDS, pH, EC, Umarala taluka, Talaja taluka.

Studies on Some Physicochemical Parameters of Soil Samples in Visnagar Taluka, District Mehsana, Gujarat, India

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ABSTRACT

The soil samples were collected from Visnagar Taluka, District Mehsana. one representative location was selected for the study and 20 samples from different direction of area were collected. The soil characterization was carried out for the parameters like pH, Electrical conductivity, organic carbon, available potash, calcium, magnesium, sulphur, phosphorous, copper, iron, manganese and zinc. Low, medium & high range of all parameter also calculated from analysis data. This information will be helpful to the farmers to solve the problems related to soil nutrients amount of which fertilizers to be added to soil to increase the yield of crops.

Microwave Assisted Synthesis and Characterization of Polyethers Based On 2, 4-Dibromo-6-Ethylquinoline

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ABSTRACT

A rapid polymerization reaction of 2, 4-dibromo-6-ethylquinoline with aromatic diols were performed with a domestic microwave oven by using Tetra butyl ammonium bromide phase transfer catalyst. The polymerization reactions, in comparison with conventional heating polycondensation, proceeded rapidly. The polymerizations gave the corresponding polyethers with inherent viscosities of 0.44– 0.72 dL/g. Prepared polyether compounds also characterized by TGA, GPC, FT-IR. Antimicrobial activity of synthesized polyethers are also good, they can be used as self-sterilized surface.

Keywords : Polymerization, phase transfer catalyst, GPC, polyether.

Study on Factor Affecting to Graft Copolymerization of Acrylamide Onto 'Patanwadi' Wool

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ABSTRACT

The "Patanwadi" Wool was chemically modified by grafting polyacrylamide in a homogeneous aqueous phase by using ceric ammonium nitrate as the initiator. The graft copolymerization of acrylamide onto wool was investigated using ceric ammonium nitrate as the initiator. The effect of initiator concentration, monomer concentration, time and temperature on % G and % GE were studied. The grafted samples were characterized using FTIR, TGA, SEM, WRV and XRD methods. From the FTIR data it was ascertained that grafting has occurred considerably. The morphology of the grafted polymer was observed from the SEM picture. The thermal analysis indicated the different stages of degradation of the grafted copolymer. Grafted products improved considerably the physical properties.

Title-Synthesis And Antimicrobial Activity Of Novel 3-Chloro-4-(Substituted Aryl)-1, 3diphenyl-1h-Pyrazole-4-Yl-1-(6-Methylpyridin-2-Yl) Azetidin-2-One Derivatives

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ABSTRACT

Azetidin-2-one derivatives as novel antimicrobial agents were carried out. Literature survey Schiff base has good antimicrobial, antifungal activity and it can be prepared by the acid catalysed reaction of aldehyde or ketone and amines. Azetidin-2-one derivatives have been exhibited to possess biological properties like antimicrobial, antifungal, anti-inflammatory, antibiotic activities. These compounds are characterized by chemical and instrumental methods. Their important biological properties have been investigated.

Keywords : Schiff Base derivatives, Biological study, pyridine derivatives, Hydrazone derivatives, azetidin derivatives

Sugar Industry Waste Water Treatment With Natural Low Cost Adsorbent : Mango Shell Charcoal And Coconut Shell Charcoal

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ABSTRACT

Plenty of waste water generates during the production of Sugar in Sugar Industry. This waste water contains Organic as well as Inorganic Materials, which causes serious environmental issues. Chemical as well as biological treatments to these waste waters are in practice since long. Among them Adsorption by low cost natural material has been proved to be an excellent way to treat industrial waste effluents. It offers significant advantages like the low-cost, availability, profitability, easy of operation and efficiency. Present study is a comparative study of two low cost natural material Mango shell charcoal(MSC) and Coconut shell charcoal(CSC). This study proves that both these material works as and adsorbent and the result of COD and BOD removal follow Freundlich and Langmuir adsorption isotherm. Coconut shell charcoal removes 50.98% of COD at the dose of 50 gm/L, whereas Mango shell charcoal removes 41.18% of COD at the dose of 50 gm/L and found exhausted for higher dosages. The BOD reduced up to 35.09% (Mango shell charcoal) and 87.72% (coconut shell charcoal). With increasing amount of both these material there found slight increase in pH, conductance and alkalinity, whereas hardness and chloride content do not affected at any dose.

Keywords: Adsorption isotherm, Adsorption intensity ($1/n$), Adsorption energy ($b \times 10^3$), Adsorption capacity (K, θ_0)

Study of Refractive Index and Density of Sugar Content in Packed Fruit Juice

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ABSTRACT

The Refractive index and density is a fundamental property of all types of liquids which can vary with concentration composition and temperature . The measurement of Refractive index were used to determination of sugar content in fruit juice quality analysis, beverage and food processing and packing and chemical processing. The packed fruit juices that were tested like orange, Apple, Gawava, lichee, Black Grape, Pomegranate , Mango. Density and PH were also measured of above juice.

Keywords : Fruit juice , Refractivr index, Density, Sugar content,PH.

Design, Characterization of Novel Chalcone Synthesized From Coumarin Derivatives Condensed With Various Aromatic Aldehyde

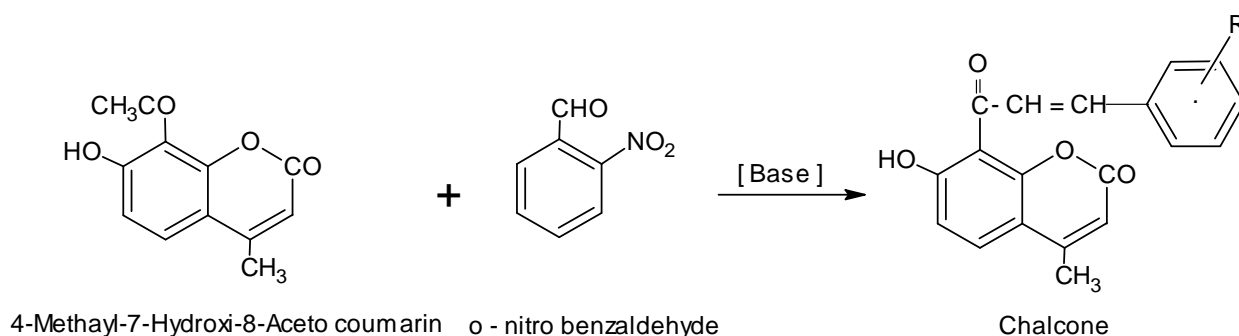
S. P. Vyas

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ABSTRACT

In the present study, Resorcinol condensed with Ethyl acetoacetate in the presence of H_2SO_4 to yield corresponding coumarin which further reacts with acetic anhydride and then reacts with aluminium chloride to yield 4-methyl-7-hydroxy-8-acetocoumarin, which reacts with aromatic aldehyde in the presence of base to yield chalcone. Final moieties have been characterized by FT-IR, 1H NMR, and Mass Spectra.

Keywords : Design, Characterization & Chalcone



Synthesis of Some Novel Pyrazolo Pyrimidine Derivatives as Potential Antimicrobial Agents

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ABSTRACT

An efficient method was developed for the synthesis of pyrazolo fused heterocycles via catalyzed free reaction of under reflux in good yields. New pyrazolo pyrimidine derivatives were prepared by cyclocondensation reaction between 3-methyl-1H-pyrazol-5(4H)-one, amino pyrazole and substituted aldehydes derivatives. This procedure provides the desired compound in good yield with a simple one-step methodology. All the synthesized compounds were characterized by their spectral study (IR, MS, ^1H and ^{13}C NMR) and were tested for their antimicrobial activity.

Qualitative Tests for Identification of Monosaccharide, Disaccharide and Polysaccharide Belongs to Carbohydrate Functional Group

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ABSTRACT

Carbohydrates are polyhydroxy compounds⁽¹⁾ that are either aldehyde or ketones containing Carbon, Hydrogen and oxygen. They are important to understand as there are large no. of carbohydrates varying from small sugar molecule i.e simple glucose to polymers such as glycogen, cellulose. Qualitative analysis of carbohydrates refers to finding out which specific sugar is present in the unknown solution.

Keywords: Qualitative tests for carbohydrates are Molisch's test, Iodine test, Barfoed's test, Benedict's test, Seliwanoff's test, Bial's test, Fehling's test and Osazone test.

Synthesis, Characterization and Antimicrobial Activity of Coordination Compounds of Thiosemicarbazone Moiety

Javed G. Mahetar, Rohit B. Manawar, Chandan T. Pashavan and Manish K. Shah*

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ABSTRACT

The synthesis and spectral analysis of coordination complexes of Copper(II), Nickel(II), Cobalt(II), Zinc(II) 1-(3-bromo-4-hydroxy-5-methoxybenzylidene)-4-(4-chlorophenyl)thiosemicarbazide was synthesized. Elucidation of ligand and coordinated compounds were done using Mass spectroscopy, IR, ^1H NMR, ^{13}C NMR spectroscopy, elemental analysis (C, H, N, S), and UV-Visible spectroscopy. All Metal complexes were prepared in a molar ratio of 1:2 (M:L) as stoichiometry data disclose. Thermo gravimetric analysis (TGA) was conducted to support the structures of all four metal complexes. Antibacterial and antifungal screenings of these coordinated compounds reveal good to excellent results with respect to ligand and standard drugs.

Synthesis, Characterization And Application AF Nano Sized Barium Chromate For Photocatalytic Degradation Of An Organic Pollutant

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ABSTRACT

In the present investigation, nano-sized barium chromate semiconducting powder has been used as a photocatalyst for the degradation of an organic dye. The semiconductor was prepared by precipitation method and it was characterized by different analytical techniques like XRD, SEM-EDS and FT-IR. Barium chromate absorbs major portion of visible light due to its yellow color and acts as an efficient photocatalyst. The effects of various operating parameters were studied to obtain optimum conditions for dye degradation. Physico-chemical parameters of the dye (before and after photocatalytic treatment) have also been reported to show the degradation of dye molecules.

Studies, Synthesis and Antimicrobial Activity of 6-Methyl-4-(3-Phenyl-Pyridine-4-Yl-Methanone-1-H-Pyrazol)-2-Thio-N-Substituted Phenyl Pyrimide-5-Carboxamide.

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ABSTRACT

Pyrimidine derivatives are most useful compounds among all the heterocyclic compounds for medicines and other various applications. Some newer pyrimidine derivatives eg. 6-methyl-4-(3-phenyl-pyridin-4-yl-methanone-1-H-pyrazol)-2-thio-N-substituted phenyl pyrimide-5-carboxamide (III a-j) have been synthesized by one pot synthesis from 3-phenyl-1-(pyridin-4-ylcarbonyl)-1-H-pyrazole-4-carbaldehyde, substituted aceto- acetanilide and urea/thiourea in acidic medium. The reactions were carried out based on well known name reaction Biginelli reaction (Aldehyde, diketo compound and urea/ thiourea). The synthesized compounds (III a-j) have been purified by column chromatography and characterized by spectroscopic technique like IR, ¹H NMR and mass spectroscopy. Preparation methods for preparation of newer aldehyde 3-phenyl-1-(pyridin-4-ylcarbonyl)-1H-pyrazole-4-carbaldehyde newer dihydropyridine derivatives (III a-j) and Solvent system/ methods for the column chromatography have been discussed in this paper with physical properties of compounds (III a-j) .

Comparative Study of PASS Assisted and in Vitro Biological Evaluation Of 'cyano' possessing fused heterocyclic derivatives

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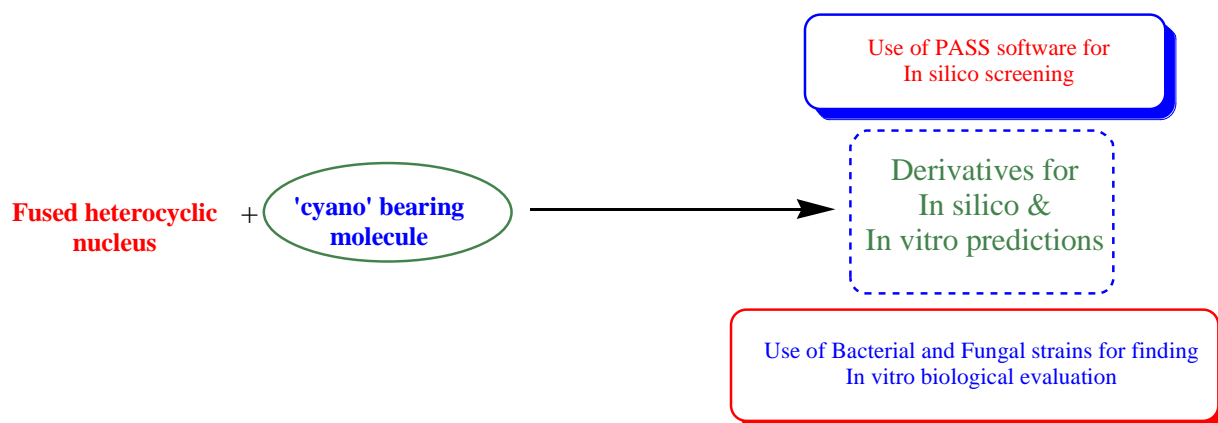
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ABSTRACT:

A series of fused heterocyclic derivatives bearing 'cyano' functional group were designed, synthesized and tested for PASS predictions (In silico studies). The synthesized compounds were tested for their In vitro antibacterial and antifungal activity against various available strains. The obtained results were compared with the PASS predicted results in order to justify the prediction.



Green And Catalyst Free Synthesis of Some New Benzo[4,5]Imidazo[1,2-A]Pyrimidine Derivatives as Antimicrobial And Antitubercular Agents”

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ABSTRACT:

There are several methods for the synthesis of benzo[4,5]imidazo[1,2-a]pyrimidine derivatives has been reported. However, many of these methods suffered from harsh reaction condition, toxic reagents, strong acidic or basic conditions, prolonged reaction-times, poor yields and low selectivity. Several modifications have been made to counter these problems. Herein we have synthesized new series of 4-(1H-Imidazol-4-yl)-2-(substituted phenyl)-1,4-dihydrobenzo[4,5]imidazo[1,2-a]pyrimidines under the frame of ‘green chemistry’. In the present study PEG 400 used as an alternative and green reaction solvent at first step and n-butanol at second step. The structures of synthesized compounds have been confirmed by spectral analysis, such as Mass, IR, ¹HNMR and ¹³CNMR. All the synthesized compounds were screened for in vitro antimicrobial and antitubercular activity. The benzo[4,5]imidazo[1,2-a]pyrimidine derivatives with a pharmacologically potent group discussed in this poster may provide valued therapeutic important in the treatment of microbial and tubercular diseases.

Synthesis and Characterization of Chromogenic Calixarene

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ABSTRACT:

Nitrocalix[4]arene was synthesized and the corresponding calix(4)arene hydroxamic acid was prepared by coupling the partially reduced nitrocalix[4]arene with anthraquinone carbonyl chloride at a very low temperature [0-(-5)⁰C] in dioxane medium with an aqueous suspension of sodium bicarbonate. Methyl calyx[6]arene was synthesized by acid catalysed reaction from p-cresol and formaldehyde in high yields, by using a simple, single step, condensation procedure. The parent Methyl calyx[6]arene hexaester was further hydrolysed to yield the corresponding acid. Styrene was substituted at the lower rim of methyl calix[6]arene through hydroxamic linkage obtained by coupling acid chloride of calix[6]arene derivative with partially reduced nitro styrene at a very low temperature [0-(-5)⁰C] in dioxane medium with an aqueous suspension of sodium bicarbonate. Calix[6]arene substituted at the methylene group by benzaldehyde was synthesized for the first time by acid catalyzed reaction from p-cresol and benzaldehyde in high yields, by using a simple, single step, condensation procedure. The synthesized calixarenes and their chromogenic derivatives were characterized by, elemental analysis and spectral techniques viz. FT – IR, ¹H-NMR, ¹³C-NMR and FAB-MS.

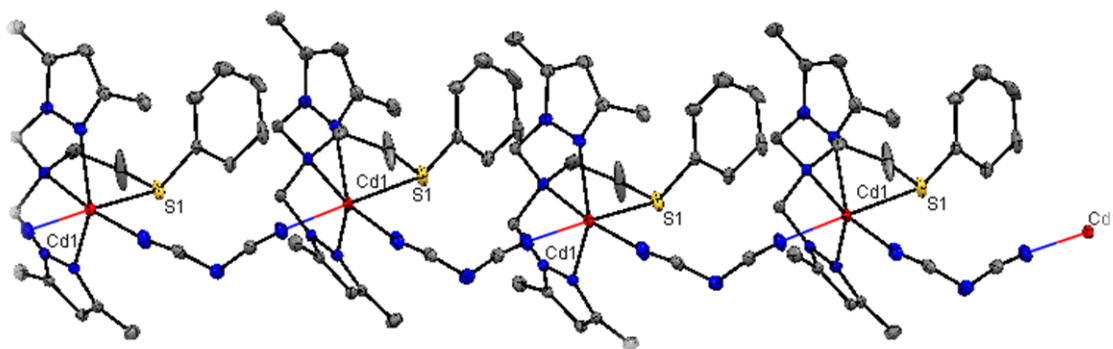
Synthesis And Structure of Coordination Polymer $[\text{Cd}(\mu\text{-1,5dca})]_n [\text{ClO}_4]_n$

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ABSTRACT:

Design and synthesis of coordination polymer have become an important area of research recently because of their useful applications in the field of microporous materials, heterogenous catalysis, molecular sensor, molecular-based magnet etc. The aim of this work is to synthesis and characterization of structure of polynuclearcadmium(II) complex using dicyanamide ion $[\text{N}(\text{CN})_2]^-$ as bridging ligand and tetradentate N_3S -coordinate ligand (L) as blocking ligand. The title compound $[\text{CdL}(\mu\text{-1,5dca})]_n(\text{ClO}_4)_n$ was synthesized by reaction of $\text{Cd}(\text{ClO}_4)_2 \cdot 6\text{H}_2\text{O}$, tetradentateligand L and bridging ligand dca in methanol at room temperature. Single crystal diffraction study of the complex shows each cadmium(II) center has octahedral geometry, four coordination sites are bonded by tetradentate ligand [three nitrogen and one Sulphur atoms] and two sites by two nitrogen atoms from two bridging dicyanamide ligands ($\mu_{1,5}$ -dca bridging) and form polymeric chain. Two cadmium centers are bonded by two dicyanamide ligands zig-zag manner. The crystal of the polynuclear complex is



In conclusion, coordination polymer of octahedral cadmium(II) complex has been synthesized and characterized.

Palladium-Catalyzed [5+2] Oxidative Annulation Of N-Arylhydrazones With Alkyne Through C-H Activation To Synthesize Benzo[D][1,2]Diazepines.

Manjoorahmed Asamdi

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ABSTRACT:

An efficient and novel method employing palladium catalyst for the synthesis of benzo[d][1,2]diazepines by [5+2] annulation of N-arylhydrazones with alkyne has been developed. This methodology undergoes through eight membered palladacycle serving as a backbone for the formation of C-C/C-N bond to synthesize benzodiazepine derivatives in moderate to good yield possessing bioactive properties.

Design, Synthesis and Biological Studies of Some 'N' and 'S' Based Heterocycle

Sandeep Thummar

ABSTRACT:

Novel series of 'N' and 'S' bridged heterocycle comprising oxadiazole, piparazine and variour amine to principal moiety 2,4,6-trichloro pyrimidine have been synthesized. Chlorine atoms of 2,4,6-trichloro pyrimidine has been subjected to nucleophile substitution sequentially varying condition to get the target molecule. The resulted compounds were characterized by IR, mass and ¹H NMR spectroscopy and further evaluated for antimicrobial activity against different strains.

Spectroscopic Characterization and Antimicrobial Studies of Some Novel Complexes

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ABSTARCT:

Coordination chemistry is a very rapidly growing branch due to its multidisciplinary characteristics. Biologically important molecules have tendency to form complex with natural receptor sites as well as coordinate compounds with biologically important metal ions. Furthermore, coordination compounds are found to be, sometimes, more physiologically active in comparison with the parent bioactive ligand. Furthermore, ligands with heterocyclic system and multiple functional groups are found to be much physiologically active. Therefore, similar kind of ligands have been taken in there complexes are prepared with Zn(II), Mn(II), Co(II), Ni(II), Cd(II), Cu(II) and Hg(II) These are characterized by spectroscopic methods and subjected to biochemical studies.

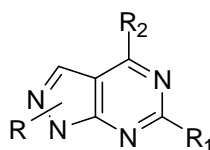
Computational Chemistryaided Study Of Pyrazolopyrimidines As Thymidylate Synthase Inhibitors

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ABSTRACT:

Molecular modelling docking is very useful tool that predict the preferred orientation of one molecule to another when bound to each other to form a stable complex. Knowledge of the preferred orientation in turn may be used to predict the strength of association or binding affinity between two molecules using, for example, gliding score functions. Herein we focused the pyrazolopyrimidineshaving potential in the field of medicinal chemistry because of their structural relevance of biogenic purine class moiety with wide spectrum of biological activities. Many well-known active pharmaceutical ingredients such as Allopurinol, Zaleplon, etc.that are based on pyrazolopyrimidine moiety.A number of pharmacological activities such as mitotic, CNS stimulant, analgesic, antipyretic, antiinflammatory, antifungal, antibacterial and anticancer activity have been reported for pyrazolopyrimidines. Considering all these facts pyrazolopyrimidines received special attention for lead compound identification. Synthesis, computational study and antibacterial activity has been undertaken for pyrazolopyrimidines. Thymidylate synthase of Escherichia coliorganism was taken as a case study which is common for Mycobacterim tuberculosis organism.



Microwave Irradiated Synthesis of Pyrazole-Carboxamides

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ABSTRACT:

To resolve the environmental issues scientists are always looking for alternative environmental friendly technology. Synergism of microwave acceleration offers rapid, yield enhancing and smooth reaction path with smooth work-up, some-times provide solvent-free condition and can be scaled up. Pyridine and pyrazole moieties are found in a large variety of naturally occurring and chemically useful molecules having diverse biological activities. Further amide bond formation is highly active. Drugs based on pyrazole linked to pyrimidine with amide bond such as Cyantraniliprole, Meclinetant and many more are available in market. It is always been interesting to study new technological development for coupling, where T₃P is found to be the most efficient providing facile acid-amine coupling with high purity and cost effective methodology for the manufacture of amides and esters, which are important ingredients for pharmaceutical and other industries. A comparative study of amide coupling using T₃P and other coupling agents like HOBT, TBTU, HATU etc. and T₃P catalyzed microwave irradiated synthesis of novel N-pyridinylpyrazole-4-carboxamides has also been carried out, where T₃P catalyzed microwave irradiated was found to be rapid and yield effective.

Synthesis, Antimicrobial Activity and Characterization of some Novel Thiozolo Pyrimidine Derivatives

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Chemistry Department, M G Science Institute, Navarangpura, Ahmedabad, Gujarat, India

ABSTRACT:

Thirteen new thiozolo pyrimidine derivatives have been synthesized from Biginelli reaction. The structures of derivatives were established on the basis of their elemental analysis, IR, NMR and Mass Spectral data. The title compounds have been tested for antibacterial and antifungal activities against different strains of bacteria.

Keywords: Thiozolo Pyrimidine, Antibacterial activity, antifungal activities, Biginelli reaction

Synthesis, Characterization and Antimicrobial Activities of Some New Pyrimidine Derivatives

Shital N. Chadotra, H. N. Patel, B. B. Baldaniya*

Department of Chemistry, M. G. Science institute, Navarangpura, Ahmedabad, Gujarat, India

ABSTRACT:

Some new oxazolo pyrimidine derivatives have been synthesized. The products tested for their antibacterial activity against Gram (+)ve and Gram (-)ve bacteria. The structures of derivatives were established on the basis of their elemental analysis, IR, NMR and Mass Spectral data.

Keywords: Oxazolo Pyrimidine, Antibacterial activity, antifungal activities, Biginelli reaction

Evaluation Of Elemental Content of Zizyphus Jujuba(Mill.) By X-Ray Fluorescence Spectroscopy (XRF)

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Asso. Professor & Head Of Chemistry Department, K.S.K.V. Kachchh University, Bhuj-Kachchh, Gujarat,
India

X-ray fluorescence spectroscopy technique is the most powerful and multi elemental analysis technique. This technique has been applied for multi elements present in dried samples of fruit of ZIZYPHUS JUJUBA. In this analysis the sample of fruit of ZIZYPHUS JUJUBA is found to possess chromium as a heavy metal in the proportion of about 0.06 %. This analysis also indicates presence of 7 micro elements and 4 macro elements. The different elements have different functions in the plant. Copper metal is useful as a component of enzymes, Ferrous metal essential for chlorophyll synthesis in photosynthesis reaction and Manganese metal as important in chloroplast production.

Keywords : ZIZYPHUS JUJUBA's fruit, XRF, Micro and Macro Elements, Heavy Metal.

The Phytochemical Investigation and Antibacterial Activity of *Ziziphus Jujuba* Mill. Fruit with Combination of *Tinospora Cordifolia* Bark

Jagruti P. Matang, Dr.Girin A. Baxi

Asso. Professor & Head Of Chemistry Department, Gabaxi K.S.K.V. Kachchh University, Bhuj-Kachchh, Gujarat, India

ABSTRACT:

Ziziphus jujuba Mill., (*Z. jujuba*) or the jujube, a herbal plant used in traditional medicine, belongs to the Rhamnaceae family and is one of the most important *Ziziphus* species. In this study, the *Ziziphus jujuba* Mill. fruit was mixed with *Tinospora cordifolia* bark in the ratio of 3:4 and 4:3. The *Ziziphus jujuba* Mill. fruit was combined with inner part of *Tinospora cordifolia* bark and outer part of *Tinospora cordifolia* bark. Both the plants were extracted in Soxhlet apparatus with ethanol solvent and the crude was collected. The crude was then subjected to GCMS study, and different phytochemical compounds were found to be present which have the different activities like antibacterial, anticancer, antioxidant, antimalarial, etc. The results indicate the effective antibacterial activity of the plant extract against the bacterial strains studied. The results of the quantitative test confirmed as *Staphylococcus aureus* and *Escherichia coli* were introduced as the most and the least sensitive bacterial strains in quantitative test. In this study, it has been observed that jujube extract has less antimicrobial effect on gram positive bacteria. The results of the present study have clearly showed acceptable antimicrobial effect of this plant extract against fungi in addition to gram positive and gram negative bacteria.

Keywords : *Ziziphus jujuba* Mill's fruit, *Tinospora cordifolia* bark, Phytochemical, antibacterial activity.

Phytochemical Analysis of Chlorobenzene Leaves Extract of *Grewia Tenax* for its Bioactive Components Through Gas Chromatographic Mass Spectrometry (GCMS) and its Antibacterial Activity by Using Agar Well Diffusion Method

Vijay R. Ram*, Mital K. Aadesariya, Girin A. Baxi

Department of Chemistry, KSKV Kachchh University, Bhuj, Kachchh, Gujarat, India

ABSTRACT:

The plant *G. tenax* is reputed to cure upset of stomachs, some skin and intestinal infections, cough, fever, diarrhoea, dysentery, jaundice, rheumatism and have mild antibiotic properties. The present study has been carried out on the phytochemical analysis and antibacterial activity of Phytoconstituents in Chlorobenzene Extract of *Grewia tenax* leaves (CBEGTL) by using Continuous soxhlet percolation extraction method. The phytochemical analysis was done by using gas chromatography-mass spectroscopy (GC-MS) whereas the mass fragment spectra of the compounds were compared with the NIST and WILLY library. The antibacterial activity of CBEGTL was performed against four different type of gram positive (*S. aureus* & *B. megaterium*) and gram negative (*P. aeruginosa* & *E. coli*) human pathogen bacteria by agar well diffusion method at $\mu\text{g/ml}$ concentration. The phytochemical analysis result of GC-MS exhibited that there are very significant phytochemicals found in CBEGTL like Fatty acid, Sesquiterpene, Hydrocarbons, Carbohydrate and Phytosterol compounds. According to antibacterial activity result the CBEGTL exhibited inhibitory activity against *S. aureus* (11mm), *B. megaterium* (11mm) and *P. aeruginosa* (14mm) while no inhibition observed against *E. coli*. Furthermore isolation and characterization of hydrocarbons will done in next step by using chromatographic techniques and also will be performed antibacterial activity by that hydrocarbon extract.

Keywords: *Grewia tenax*, GC/MS, Phytochemicals, Chlorobenzene extract, Soxhlet extraction, antibacterial activity

Identification of Lutein from *Tagetes Erecta L.* and It's Antioxidant Properties

Khyati K. Bhatt, Dr. DivyaGangal*, Prof. Disha Khetani*

St. Xavier's College(Autonomous), Navrangpura, Ahmedabad, Gujarat, India

ABSTRACT:

Marigold is a rich source of Xanthophyll called Lutein, which is a member of carotenoid group. This is a yellow pigment. Lutein shows antioxidant and anticancer activities and is beneficial to eye health. This led to extraction and saponification process to obtain free lutein suitable for human applied ions. The work includes extraction of lutein which is a fatty ester with different solvents and study of TLC. Free lutein was obtained through saponification process and characterized by UV and FTIR spectrum. Antioxidant property was studied using DPPH as free radical scavenger. DPPH provides an easy and rapid ways to evaluate potential antioxidants.

Keywords: Marigold, Xanthophyll, Carotenoid, Antioxidant, DPPH.

Analytical Application of Thiazole-Azo-Calix-[4]-Resorcinarene

P Dibyashree Patra, Dr. Mallika Sanyal*,

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ABSTRACT:

Some heavy metal ions such as Pb^{2+} , Hg^{2+} , Cd^{2+} , etc., have been contaminating consumable water since industrialization has raised its hood. The detection of these ions is an indispensable affair. The presence of these ions have affected many lives gravely. The whole purpose of the research was to synthesize, characterize, and study the analytical application: metal ion encapsulation property of the 2-amino thiazole derivative of calix[4]resorcinarene. The first step dealt with the preparation of calix-[4]-resorcinarene from resorcinarene and acetaldehyde in acidic medium. The next step was reaction of calix-[4]-resorcinarene with 2-amino thiazole to form thiazole-azo-calix-[4]-resorcinarene. This product was first spectroscopically analyzed and then its metal ion encapsulation properties were studied. It was found that it complexes with Pb^{2+} , Hg^{2+} ions giving a sharp color change. Further work was done with lead ions. Various dilutions of these ions were prepared. This was found effective to detect lead ions in as low as 10ppm. Total permissible lead content in water is 15ppm. This work will be pioneer for further studies which want to detect heavy metal ions in low concentrations. The reactions and synthesis were carried out in laboratory without much complications or costly chemicals. This has to be one of the best ways for analysis of lead ions.

Keywords: resorcinarene, acetaldehyde, 2-amino-thiazole, encapsulation

Synthesis, Characterization and Anti-Microbial Activities of (NE)-N-{(4-Hydroxy-3-Methoxy Phenyl) (Substituted Phenyldiazenyl) Methylene}-4-(3-Nitrophenyl)-5- (Substituted Phenyldiazenyl)Thiazole-2-Amine :(Formazans)

Ahir Suresh, Modh Parashar, Mistry Mitesh

Shri C. N. P. F. Arts and D. N. Science College, Dabhoi, Gujarat, India

ABSTRACT:

The aim and objective of the work was to develop novel Schiff bases and Formazans. Formazans was first prepared many years ago, but today also formazans occupy an important role in pharmaceutical chemistry. They are endowed with a variety of pharmacological activities. In this study (NE)-N-{(4-hydroxy-3-methoxy phenyl) (substituted phenyldiazenyl) methylene}-4-(3-nitrophenyl)-5-(substituted phenyldiazenyl)thiazole-2-amine were synthesized by condensation of various Schiff base and diazonium salt of various substituted aromatic amines. The synthesized compounds were then established on the basis of IR, ¹HNMR spectra and screened for anti-microbial activities.

Keywords: Schiff base, formazans, anti-microbial activity

Synthesis and Characterization of Some New Pyrimidine Derivatives as Potent Anti-Tubercular Agents Using Computer-Aided Drug Design Approach

Bhavin Vavaiya, Dr. S H Patel, Dr. P K Patel*

Department of chemistry, M.G Science collage, Navrangpura, Ahmedabad, Gujarat, India

ABSTRACT:

Synthesis and characterization of different pyrimidine derivatives. The targeted compounds were screened first using computer-aided drug design approach later they will synthesize and isolate and characterized by ¹H-NMR and Mass spectroscopy. All synthesised compounds will be screen for their biological efficacy. We aim to achieve the desired potency of the compounds and also to ensure that the target compounds are active not only against H37Rv strain, but also against resistant Mycobacterium strains. Thus obtained lead compounds are expected to be promising lead candidates for further investigation for their pharmacokinetic and safety profiles.

Biogenic Silver Nanoparticles Synthesized From Root Extract Of *Iris Germanica* and its Antibacterial Application.

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²Pacific University, Udaipur, Rajasthan, India

ABSTRACT:

Biological entity is gaining significant importance due to its large area of medicinal applications. 80% of the world populations preferred plant based ayurvedic preparations since very long time due its fewer side effects. The synthesized metal nanoparticles are an expanding research area due to the potential applications in medical domain. In our research work, we have described a cost effective and environment friendly technique for green synthesis of silver nanoparticles and evaluated their Antibacterial activity. Synthesis and characterization of silver nanoparticles demonstrated by using root extract of *Iris germanica* plant as reducing agent as well as capping agent. The Synthesized nanoparticles were characterized with UV-Visible spectrometry (UV-Vis), Fourier transform infrared spectroscopy (FT-IR), Field Electron Gun Scanning Electron Microscopy (FEG-SEM), High Resolution Transmission Electron Microscopy (HR-TEM) and X-ray diffraction spectroscopy (XRD). Biologically synthesized silver nanoparticles exhibited significant antibacterial activity against pathogenic bacteria.

Keywords: *Iris germanica* plant extract as a reducing agent, Antibacterial activity, AgNO₃ salt.

A One-Pot Microwave Irradiation Synthesis of Pyrimido[1,2-A]Benzimidazoles

Haresh ram, Bhavesh dodiya, Dinesh kundariya, Govind kher

Tolani college of arts and Science Adipur, R.R.Lalan College Bhuj, Gujarat, India

ABSTRACT:

Synthesis of a series of pyrimido[1,2-a]benzimidazoles (**4a-j**) was achieved from different Acetoacetamides, 3,4,5-dimethoxybenzaldehyde and 2-Aminobenzimidazole using microwave irradiation within 10 minutes with high yield. The structures of the products were supported by FTIR, PMR and mass spectral data. Pyrimido[1,2-a]benzimidazoles; Acetoacetamides; 2-Aminobenzimidazole, microwave irradiation.

A Simplified Approach to Understand Selected Topics in Chemistry

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Department of Chemistry, St Xavier's College (Autonomous) Ahmedabad, Gujarat, India

ABSTRACT:

Various laboratory experiments and theoretical concepts in chemistry are made simple for understanding. A brief work allows new ideas to understand and improve interest in selected topics in chemistry. Basic motive of this exposition is to encourage innovative ideas and use of latest information available that surrounds us for better understanding of chemistry.

Synthesis and Characterization of Porphyrin Based Macromolecule and its Metal Complex

Dr. Naimish K Chavda

M.G.Science Institute Ahmedabad, Gujarat, India

ABSTRACT:

The new porphyrin based ligands has been synthesized and characterized using FAB-mass spectroscopy, ^1H NMR, ^{13}C NMR and UV-Vis spectrophotometry. The NMR confirmed the structure of the compound and the mass spectrum was in agreement with the proposed molecular formula. The UV-Vis absorption spectrum of synthesized compound shows characteristic spectral patterns similar to proposed structure with a Soret band at 419 nm and four Q bands at 515, 550, 590, and 648 nm. Protonation of the porphyrin with TFA resulted in the expected red shift of the Soret band. Excitation at 419nm gave an emission at 650nm. Metal complex of the newly synthesized porphyrin ligand was synthesized and characterized by various analytical techniques.

Keywords : Porphyrin; Spectral analyses; Metal complex;

Synthesis, Characterization and Viscometric Study of Carboxymethyl Epoxy Resin Based Polyesters

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Navrangpura, Ahmedabad, Gujarat, India

ABSTRACT:

Viscometric study of solutions of various carboxymethylated epoxy resin based polyesters in 1,4-dioxane solvent was carried out. Measurement was performed using Ubbelohde suspended type viscometer. The viscosity for all CMPE solutions were determined in 1,4-dioxane at $30 \pm 0.1^\circ\text{C}$. The viscosity data of all solutions suggest the decrease in concentration of solution which increases reduced viscosity (η_{red}). Therefore the CMPE resins act as polyelectrolyte of anionic type. The viscosity of the solution in 1,4-dioxane suppressed by adding water and KBr, though the intrinsic viscosity measurements are carried out for all resin solutions in Dioxane-Water-KBr having 75:25:1% ratio. Also empirical equation was adopted to represent the viscometric data for all the resins. It may be stated that as the equation is quite empirical.

$$\eta_{\text{sp}/c} = Z = [\eta] + \frac{k[\eta]}{C^{1/2}}$$

Keywords: Polyelectrolyte, CMPE, reduced viscosity, empirical relation and intrinsic viscosity.

A New Synthesis of Containing Chloro Fluoropyrimidine Derivatives

Jatin Vora, Kartik Vyas

ABSTRACT:

Synthesis of a series of 4-(2-chloro-6-fluorophenyl)-1,2,3,4-tetrahydro-6-isopropyl-N-(substitutedphenyl)-2-oxopyrimidine-5-carboxamide. was achieved from different active methylene and 2-chloro-6-fluorobenzaldehyde using hardly any drops of conc. hydrochloric acid added and refluxed with alcohol so to the very well yield. The structures of the products were supported by FTIR, NMR and mass spectral data.

Keywords: 2-chloro-6-fluorobenzaldehyde; hydrochloric acid, alcohol only refluxed.

Mesomorphism Comparison of Azo-Esters and Chalcone-Esters

Dr. H. N. Chauhan, Dr. D.M.Suthar and Dr.R. P. Chaudhri

Chemistry Department, K. K. Shah Jarodwala Maninagar Science College, Gujarat University, Ahmedabad, Gujarat, India

ABSTRACT:

One chalcone-ester homologous series of mesogens α -4-[4'-nalkoxy benzoyloxy phenyl β -4''Nitro benzoyl ethylenes (A) and one azo-ester homologous series of mesogens p-(p'-n-alkoxybenzoyloxy) phenyl azo-p''-methoxy benzene (B) being structurally similar are discussed. Both series (A) and (B) differ in respect of central bridges linking two phenyl rings and terminal groups linking with one phenyle ring. Mesomorphic properties start from 6th member of series (A) and (B). In series (A), 6th to 14th members show both smectogenic and nematogenic properties, and the 16th member show only nematogenic property. While in series (B), 1st to 10th members show nematogenic properties. Thermal stability of series (A) is relatively high as compared to series (B). Transition temperatures are observed through hot stage polarizing microscope by the miscibility method. Analytical data support the structure of molecules.

Keywords: Azo-ester; chalcone-ester; mesogen; mesophase; nematic; smectic

Elemental Distribution in Parts of Mare Tranquillitatis of Near Side of the Moon Using Hyperspectral Imager (Hysi) Data

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ABSTRACT:

To understand a planet it is essential to determine its chemistry. Major elements present on the Moon are Oxygen (O), Silicon (Si), Iron (Fe), Magnesium (Mg), Calcium (Ca), Aluminium (Al) and Titanium (Ti). The study of compositional variation using remote sensing data and reflectance spectroscopy is being done from five decades. In the reflectance spectra, wavelength position, shape and strength of the Fe²⁺ absorption features vary from mineral to mineral depending on the properties of the crystallographic sites they occupy and also on the basis of relative abundances and compositions of mafic minerals present. Based on absorption feature in the reflectance spectra we can identify particular mineral and the probable elements present in the area. For this work, we have used Hyperspectral Imager (HySI) data from India's first Moon Mission - Chandrayan-1, launched in October, 2008. Here, we have selected the western part of Tranquillitatis basin, situated on the near side of the Moon. Mare Tranquillitatis is of Pre-Nectarian age. It's a non-mascon basin, located at 7°N and 30°E and shows two prominent ring structures with 700 and 900 km diameters, respectively. Using the Band Parameter technique, we have analysed the area and identified the probable elements present in the area by generating Rock type colour composite image. Band Parameters comprises of band tilt (BT), band strength (BS), and band curvature (BC). By assigning Red, Green, Blue channel to corresponding BC, BT, BS parameter we have generated rock type colour composite image. Two different basaltic unit have been identified as ancient mature mare units, highland contaminated mare unit on the basis of spectral signature and spectral band parameters. Area shows absence of younger mare units. Pyroxenes are silicon-aluminum oxides with Ca, Na, Fe, Mg, Mn and Li. High Calcium Pyroxene rich fresh crater are present in various part within ancient mature mare units and in the highland area. Very small craters have been identified in the feldspathic (alumino silicate) highland terrain, compositionally rich in High Calcium Pyroxene and/Oilvine (Mg²⁺, Fe²⁺)₂SiO₄. However,

presence of Low Calcium Pyroxene rich fresh crater in the highland contaminated mare is found in very less amount.

Quaternization of Acrylonitrile Treated Cotton Fabric to Introduce Antibacterial Properties

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ABSTRACT:

The primary objective of modifying cotton fabric was to impart bactericidal properties to attract various fields such as defense, space and textile industrial applications and incorporation of phosphorus element to impart flame retardancy. Chemically initiated graft copolymerization of acrylonitrile (AN) onto cotton fabric was carried out using ceric ammonium nitrate as a redox initiator. Optimum conditions pertaining to maximum percentage of grafting were evaluated as a function of concentration of initiator [CAN], concentration of nitric acid, monomer concentration, water, temperature and reaction time. Maximum grafting of AN (69.23%) was obtained at optimum [CAN]= 2.19×10^{-2} moles/L, [AN]= 18.85×10^{-22} moles/L, [HNO₃]= 89.5×10^{-22} moles/L in 25 ml of water at an optimum temperature 60°C with 120 minutes. Antibacterial properties were induced into the modified cotton fabric by treating the grafted fabric with benzyl chloride. The grafted and quaternized samples were characterized by FTIR and Thermo gravimetric analysis and scanning electron microscopy. Their physicochemical properties such as crease recovery angle, wettability, moisture regain and mechanical strength is also studied. The bactericidal action of cotton fabric was tested by filtration test. The quaternized sample shows good antibacterial activity.

Keywords: Cotton fabric, Graft copolymerization, Acrylonitrile, antibacterial, Filtration test.

Nano Particle (Ion Exchange Resin-MPTF): Preparation And Physicochemical Properties

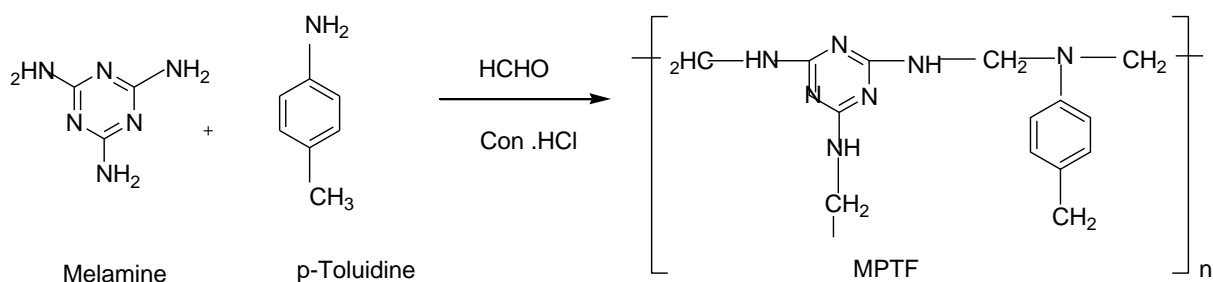
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ABSTRACT:

Ion exchangers are either cation exchangers that exchange positively charged ions (cations) or anion exchangers that exchange negatively charged ions (anions). There are also amphoteric exchangers that are able to exchange both cations and anions simultaneously.

In the preparation of MPTF, p-toluidine was reacted with formaldehyde and melamine. For the synthesis of MPTF hydrochloric acid was used as a catalyst. These resins were characterized by elemental analysis. Synthesized nano particle shows ion exchange capability. Ion exchange resin also showed reusability and stability at an elevated temperature.



Keywords: Ion-exchange, melamine, p-toluidine, formaldehyde, thermal stability

Nanomaterial Based Medicine And Medical Aids

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ABSTRACT:

One of the 21st century's most promising technologies is nanotechnology. Nano medicine, an offshoot of nanotechnology, refers to curing disease or repairing damaged tissues, such as bone, muscle, or nerve. Now a days a major success is owed to the way in which the unique physical and optical properties of NPs (Nanoparticles) being an achievement by researchers. Both these unique properties with the ease of synthesis, biocompatibility and customizability of NPs. There are many applications of nanoparticle and medicines are one of them. Nano medicine is, an inorganic NP with a biologically functional ligand provides the basis for the biomedical applications. The flexibility of Nano-technology allows for the development of safer, effective, diagnostic, therapeutic and imaging modalities. Recently NP based technology has led to the development in fighting diseases like cancer. NPs can deliver key information throughout the clinical process. Nano medicine eliminate all common diseases and all medical pain. This article present an overview about ways of synthesis and their applications as Nano medicine and nanomedical aids.

Thermodynamic Studies of Complex Formation Between 18-Crown-6 (18C6) With La^{3+} , Ce^{3+} , Pr^{3+} and Nd^{3+} Cations In Some Pure and Binary Mixed Solvent Systems

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ABSTRACT:

In the present work we have studied the complexation reactions of 18-crown-6 (18C6) with La^{3+} , Ce^{3+} , Pr^{3+} and Nd^{3+} cations in pure acetonitrile (AN), pure water (H_2O) and acetonitrile - water (AN- H_2O) binary solvent mixtures at different temperatures by the conductometric method. The stability constants of the resulting 1:1 complexes were determined from computer fitting of the conductance versus mole ratio data. The values of stability constants of complexes, which were obtained from conductometric data, show that the stability of complexes is affected by the nature and composition of the binary mixed solvents. The corresponding thermodynamic parameters (ΔH^0 , ΔS^0 and ΔG^0) were obtained from the temperature dependence of the stability constants using van't Hoff plots. The results show that the values and also the sign of these parameters are influenced by the nature and composition of the mixed solvents.

Soil Characteristics of Different Agricultural Sites of Bhavanagar District in Gujarat

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ABSTRACT:

This paper presents the study of different Physico-Chemical Parameters of soil in agricultural Sites of Bhavnagar District, Gujarat. Agricultural soil samples were collected by authorized locally trained farmers and brought for analysis to Soil Test Laboratory. All samples analysed using standard reported methods. Different Soil parameters, namely pH, EC, C, P, K, Zn, Fe, S, Mn, Ca, Mg and Cu were considered for this study. This study also concludes that statistical analysis application can give a scientific base for agriculture soil fertility management in present village system.

A Rapid and Sensitive UHPLC-MS/MS Assay for the Determination of Clobazam in Human Plasma Using Electro Spray Ionization Technology

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ABSTRACT:

A simple, highly sensitive, precise and accurate high-performance liquid chromatographic (LC-MS/MS) method with mass detection was developed and validated for the rapid quantification of Clobazam in human plasma samples. The chromatographic separation was achieved with a reverse phase column Reprisil Gold XBD C18 (100 × 3 mm, 3 μm) and the mobile phase consisted of 10 mM Ammonium Acetate Buffer and 0.1 % Acetic acid in Methanol (15:85 v/v) as eluent by running a linear gradient method. The effluence was ionized by positive electro spray ionization and measured by mass spectrometry. The calibration curve was linear with range of 0.501-499.995 ng/mL and the lower limit of quantification was 0.501 ng/mL with good accuracy and precision. The mean extraction recovery of the method was higher than 96.4% and 103.3% for clobazam and IS, respectively. The method was successfully demonstrated for evaluation of pharmacokinetic profile of clobazam in human plasma and validated for excellent selectivity, accuracy, precision, recovery and stability.

A Convenient Synthesis of 2-Azitidinone Via-Safer and Green Catalyst

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ABSTRACT:

In order to establish a convenient and safer systemic methodology for the syntheses of β -lactam we have undertaken this study. Green approach has been adopted for the synthesis of some new series of β -lactam. The moiety have selected on the bases of its potential chemotherapeutic activity. Selected base azitidinone moiety is, having with earlier reported numerous antimicrobial activities. The position 2 of lactone is bearing with highly interested for our study. Our study is established with aim to contrast the ultrasound/microwave with conventional/traditional system. The use of green catalyst is the aim and key point of this study. We mixed both the route and designed to synthesize the targeted molecules. The characterizations of the compounds have been done by UV, FT-IR and Mass analyzers. Results of biological activities have been inspired us for further anti-carcinogen study and with its QSAR study.

Novel 4- Thiazolidinones and Its Styryl Derivatives : Design, Synthesis and Characterization of Biologically Potent Antibacterial Agents

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ABSTRACT:

Two series of some new 4-thiazolidinones and styryl containing derivatives were designed and synthesized, screened for their antimicrobial activities. The structures of the compounds were elucidated with the aid of IR, ¹H NMR spectroscopy, and elemental analysis. The antimicrobial activity of the compounds were tested against four bacteria (Staphylococcus aureus MTCC 443 and Staphylococcus pyogenus MTCC 443) and two Gram-negative (Escherichia coli MTCC 442 and Pseudomonas aeruginosa MTCC 443).

Keywords: Thiazolidinone; styryl; antibacterial activity.

Synthesis of Strontium Hexaferrite Nano Particles Via Wet Chemical Route

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ABSTRACT:

Hexaferrites are considered as a magnetic material, which can be used as a permanent memory storage devices. Different chemical routes are used to prepare Strontium hexaferrite powders like ceramic route, co-precipitation method, sol-gel process, auto-combustion route, hydrothermal, micro-emulsion etc. Convention ceramic route requires high temperature calcinations (1400 °C). Here Strontium hexaferrite SrFe₁₂O₁₉ particles containing polyoxyethelene (20) sorbitan monoolate (Tween-80) were synthesized by a chemical co-precipitation technique with a precipitator NH₃.H₂O. The prepared Sr-M hexaferrite precipitates were heat treated at various temperatures 650 °C, 750 °C, 850 °C, 950 °C and 1100 °C for 4 hrs in a muffle furnace. The obtained Sr-M powders were characterized by using various instrumental techniques like FTIR, TGA, XRD, SEM and VSM. Their physical as well as magnetic properties were compared. It was observed from XRD results that heat treatment conditions play significant role in the formation of pure SrFe₁₂O₁₉ hexaferrite phase and also in the grain size. The estimated particle size is of the order of nanometer when suitable calcinations temperature is applied. SEM micrographs show an increase in crystallite size of the resultant SrFe₁₂O₁₉ hexaferrite particles sintered at higher temperature (1100 °C).

Improvement of Water Quality of Charada Lake of Gandhinager District by Using Natural And Synthetic Coagulants

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ABSTRACT:

Access to safe drinking and irrigation water is important as a health and development issue at national, regional and local levels. Especially in rural areas, rely on unimproved sources and need for finding ways of treating water is crucial. Turbidity imparts a great problem in water treatment. For this Developing countries pay a high cost to import costly chemicals for water treatment. So in the present study i investigate the natural and their combination with Natural + Synthetic Coagulants on Charada Lake water of Gandhinager District, Gujarat for two different seasons, result shows that after treatment it reduce physico-chemical parameters but still it is not in permissible limit which is recognized by WHO.

Formation of Wollastonite (CaSiO_2) and Diopside ($\text{CaMgSi}_2\text{O}_6$) Due to Thermal Metamorphism at Kui Village Near Abu Road, Rajasthan, India

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ABSTRACT:

Formation of minerals wollastonite and diopside has occurred due to thermal metamorphism of limestone and dolomitic limestone containing siliceous impurity. The effect was induced in the rock as a result of development of large plug shape intrusion of troctolite (a gabbro containing titan augite + olivine + plagioclase) within the country rock limestone due to thermal metamorphism. The intrusion of magma must have been occurred under plutonic condition at a depth of more than ~ 7 km depth because the rock troctolite shows granitic texture (holocrystalline and hypidiomorphic texture) where rock is entirely made up of mineral crystals which are partly developed or subhedral. The rock is melanocratic in colour due to complete absence of quartz and presence of plagioclase and titan augite. The rock is basic in nature due to presence of plagioclase and titan augite and complete absence of orthoclase. The rock belongs to soda-lime series due to presence of plagioclase, where it is labradorite or bytownite type. The rock can be considered as of femic type due to presence of titan augite and olivine. The limestone is affected by temperature or heat effect only, which is considered under thermal metamorphism. Here, pressure may be generated only due to thermal expansion of the rock and crowding aside of the rock due to penetration of the magma, which is generally negligible. Further, water content in the magma must be less or absent, as a result of which limited metamorphic aureole is formed with no development of water containing mica or amphibole group of minerals. Furthermore, limestone must be dolomitic at places with siliceous impurity and only limestone with siliceous impurity must be present, which has given rise to $\text{CaCO}_3 + \text{SiO}_2 = \text{CaSiO}_3 + \text{CO}_2$. The CO_2 must have escaped from the resulting wollastonite or might have been trapped in cavities which are found in wollastonite. Dolomitic limestone containing siliceous impurity has provided diopside with chemical reaction: $\text{CaMg}(\text{CO}_3)_2 + 2\text{SiO}_2 = \text{CaMgSi}_2\text{O}_6 + \text{CO}_2$. Here also cavities are present which suggest escape or trapping of CO_2 in the rock. At places wollastonite-pyroxene rock occurs together indicating presence of both limestone and dolomitic limestone with silica as impurity.

Keywords: Charada Lack, Water treatment, Natural and Synthetic Coagulant, Turbidity.

Calculations of Total and Differential Cross-Section of Scattering of Electron from Target Like Metastable Atom-A Theoretical Survey

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ABSTRACT:

Scattering cross sections may be defined in nuclear, atomic and particle physics for collisions of one type of particle with targets; either stationary or moving. The probability for any given reaction to occur is in proportion to its cross section. Thus to find the cross section for a given reaction is a proxy for stating the probability that a given scattering process will occur. The total (σ_{tot}) and differential ($d\sigma$) cross sections are among the most important measurable quantities and it can reveal a great amount of information about the internal structure of target particle. Differential cross section ($d\sigma$) in inelastic scattering contain resonance peaks that indicate the creation of metastable state and contain information about their energy and lifetime. The given study provides the calculations of total and differential cross-section of scattering of electron(intermediate energy) from target like metastable atom e.g. He and the study of electron density distribution of it.

Keywords: Total cross section (σ_{tot}), differential cross section ($d\sigma$), metastable atom, electron density distribution

Synthesis and Biological Activities of Metal Complexes

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ABSTRACT:

Transition metal (II) complexes, $[ML_2(H_2O)_2]$ 1–4, were synthesized by the reaction of $MCl_2 \cdot nH_2O$ ($M = Cu, Ni, Co, Mn$) and the schiff base ligand. Schiff base were synthesis by condensation of 2-hydroxy Aceto phenone with aromatic amines. Synthesized complexes were characterized by elemental analysis, FT-IR spectra and TGA. The Schiff base ligand and its complexes have been tested in vitro antibacterial activity against bacteria, viz. *Escherichia coli* MTCC – 443, *Pseudomonas aeruginosa* MTCC – 1688, *Bacillus subtilis* MTCC – 441, *Staphylococcus aureus* MTCC – 96 and fungal strain *Aspergillus niger* MTCC – 282. It has been found that the complexes have higher activity than the corresponding schiff base ligand in comparison with the same bacterial and fungal strains.

Keywords : Transition metal (II) complex; Schiff base; antibacterial activity

Synthesis and Characterization of A Novel Ester Homologous Series :P(P'-N-Alkoxy Benzoyloxy) B-Phenyl – Ethyl Cinnamates

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ABSTRACT:

A novel homologous series (p'-n-Alkoxy Benzoyloxy) β -Phenyl Ethyl Cinnamates is synthesized and studied with a view to understanding and establishing the effects of molecular structure on mesogenic behavior in a series. The mesogenic property commences from third homologue to the last homologue. The transition temperatures of the series are relatively high, ranging between 152 °C and 225 °C. The mesogenic range varies between 8 °C (C₁₆) and 37 °C (C₆). The novel ester series is nematogenic without exhibition of any smectogenic property and an average thermal stability of 167.6 °C. The mesogenic behavior of the novel series is compared with structurally similar isomeric/nonisomeric other known series.

Keywords : Liquid crystal; Mesogen; mesomorphism; nematic; smectic

Preparation, Spectral and Biological Evolution of 2-(Helophenyle -1,3,4 -Oxadiazole -2-Yl-5-Sulfanyl) -4-(Cyclohexalamino)-6-(Arylamino) -S-Traizine

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ABSTRACT:

The s-triazine and their derivatives are important intermediates in organic synthesis and widespread application in medical sciences. The title s-triazine derivatives were synthesized with different substituted aryl amine. The synthesis derivatives were characterised by FTIR, ¹H NMR and Mass. Synthesized compound were screened for their microbial activity against standard drugs.

Keywords: Helophenyle , oxadiazole , aryleamino, sulphanyl, s-triazine

Synthesis, Characterization and Glass Reinforcement of Poly [Urethane-Imide] S

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ABSTRACT:

Poly (urethane-imide)s (PUIs) were prepared by the intermolecular Diels-Alder (DA) Reaction of Hexamethylene bis(2-Furanylmethylthioethyl carbamate) (HMFTC) with various bismaleimides. The DA reaction was carried out in 1, 4 – dioxane as a solvent as well as in bulk, followed by aromatization of tetrahydrophthalimide intermediates in the presence of acetic anhydride. All the polymers were characterized by elemental analysis, IR spectral studies and thermogravimetry. The PUIs exhibit moderate thermal stability. HMFTC and bismaleimides were polymerized (at 145 + 10 °C) by an “in situ” DA intermolecular reaction into moderately thermally stable PUIs glass-fibre composite (i.e. laminates) and were characterized by their chemical resistance and mechanical properties.

Keywords: Poly (urethane-imide)s (PUIs); bismaleimides; IR spectroscopy ; TGA Glass-fiber reinforced composites.

Plastic Polymer Is Eco-Friend with the Environment

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ABSTRACT:

Plastics save green house emissions and save the earth from Global warming. It is replacing materials due to superior properties. Plastic carry bag accounts for less than 1% of total plastic consumption. Energy saving 81% for plastic bag as compare to jute bag. This gives a comparative analysis of environmental burden generated by paper, jute and textiles bags which are not visible to naked eyes though in comparison to plastic bags. Polythene is approved safe material for use for packing, plastics are to toxicity. Emissions at fire situation have similar or less implications in comparison as like wood, paper & cotton. Emissions during burning of paper and polythene are similar. During decomposition state biodegradable (Recycle plastic) plastics emit CO_2 & CH_4 Both are green house gases, so plastic as a ecofriendly to environment. Green chemistry is very useful in our daily life.

Keywords : Plastic polymer, jute bags, biodegradable plastic, green chemistry etc.

Mesomorphic Properties of Structure Related Ester Homologous Compounds :P-(P'-N-Alkoxy Benzoyloxy) Ter-Butyl Cinnamates.

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Abstract :

A novel homologous series of p-(p'-n-Alkoxy Benzoyloxy) ter-Butyl Cinnamates was synthesized and studied for mesophase behavior dependence on molecular structure. The nematogenic mesophase is exhibited from the Pentylloxy to the last member hexadecyloxy derivative and the smectogenic mesophase from the pentylloxy to the tetradecyloxy member of the series. The nematic mesophase is of a threaded or Schlieren type, and the smectic mesophase is of a focal conic fan of the type A or C. Mesomorphic properties of the present novel homologous series are compared with other structurally similar homologous series. The average smectic and nematic thermal stabilities are 172.33 °C and 202.14 °C, respectively. Smectogenic phase lengths vary from 22 °C (C₁₄) to 58 °C (C₈) and the nematogenic phase lengths vary from 10 °C (C₁₆) to 50 °C (C₅). The series is partly nematogenic and smectogenic with considerable mesophase length. It is a middle ordered melting type series, whose relative group efficiency order for nematic derived.

Keywords : Liquid crystal; mesomorphic; monotropic; nematic; smectic

Biodegradability and Mechanical Studies of Natural Polymers with Polyolefin

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ABSTRACT:

Biodegradable polymer have been attracting much attention owing to concerns related to environmental pollution by plastic waste. As a result attempts have been made to solve this problem by blending natural polymer into synthetic polymer. Polymer blends are capable of providing material which extent the useful properties beyond the range that can be obtain from single polymer equivalents. The melt blending of LDPE/HDPE/PP with different proportion of starch and pectin has been studied individually. The melt blending was carried out using twin screw extruder which was followed by injection moulding process. Various mechanical, chemical and biodegradable tests carried out for this blend.

Keywords: Natural polymer, polyolefin, biodegradation, mechanical properties

Preparation and Characterization of TPU-PP/ Cenosphere Value-Added Composite

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Abstract:

Particulate Composite is a microscopic combination of matrix and reinforcing material with a recognizable interface between them. Cenosphere is an inexpensive waste generated in bulk from thermal power station. It can be use as a reinforcing material in various composite systems. In this study, particulate composite of TPU-PP (matrix phase) and cenosphere (reinforcing phase) are prepared and extensively studied with respect to their modified and unmodified interface. Non-surface treated cenosphere has been found to get agglomerate during their blending with polymer matrix which subsequently reduces its overall performance. So, its surface was modified by 3-aminopropyl triethoxy silane coupling agent and on the other hand matrix was modified by glycidyl methacrylate (PP-g-GMA). Surface modified cenosphere and synthesized compatibilizer were functionally characterized by FTIR spectroscopy. Composites of TPU-PP/cenosphere were prepared having cenosphere concentration between 5-20% by weight. Morphological studies of all the prepared composite variants were done by scanning electron microscope. In general, composites with an improved interface found to possess enhanced mechanical, thermal & chemical properties.

Keywords : TPU (Thermoplastic polyurethane), PP (Polypropylene), Cenosphere, Particulate Composite, 3-aminopropyl triethoxy silane coupling agent, Glycidyl methacrylate

Synthesis and Characterization of Modified Starch and its Blend With LDPE

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ABSTRACT

Starch have now become cynosure among all the others because of an unusual combination of biological activities plus mechanical and physical properties. Present work comprises the chemical modification of starch by grafting vinyl monomers i.e. Methyl methacrylate and acrylamide in a homogeneous aqueous phase using ceric ammonium nitrate (CAN) as the initiator. All these three variants of starch was blended with low-density polyethylene (LDPE) in various composition. Low density polyethylene was grafted with maleic anhydride and subsequently used as a compatibilizer to promote the interfacial interaction between the ingredients. The characterization of the grafted products was confirmed by Fourier Transform Infrared spectroscopy (FT-IR) as well as Percentage grafting G (%), percentage efficiency E (%) and yield of graft copolymerization, Y (%) was determined. The prepared blends were subjected to Scanning Electron Microscopy (SEM), thermal gravimetric analysis (TGA) and biodegradation study.

Keywords: Starch, graft co-polymers, CAN, LDPE, LDPE-g-MA, and biodegradation

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