Graphical Abstract

Paper-1

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Efficient synthesis of cyclic enamines from morpholine and cycloalkanones catalyzed by zeolite H-Y

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Design and synthesis of a new epoxide-steroid carboxamide derivative

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Synthesis of an epoxide-steroid carboxamide derivative from estradiol using some chemical strategies. The chemical structure was evaluated through both ¹H NMR and ¹³C NMR spectroscopic analysis.
Improving the practical ability of undergraduate applied chemistry students through the measurement of polysaccharide content in oilfield chemicals

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The reaction between polysaccharide and sulfuric acid produces the furfural molecules, which then react with the phenol molecules. The complex molecules with light yellow color are produced through the above reactions as presented.

Room temperature, green and efficient synthesis of 4,4′-(arylmethylene)bis(1H-pyrazol-5-ols)


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An eco-friendly and efficient pseudo three component method for the synthesis of 4,4′-(arylmethylene)bis(1H-pyrazol-5-ols) has been accomplished by tandem Knoevenagel–Michael reaction of various aromatic aldehydes with 5-methyl-2-phenyl- 2,4-dihydro-3H-pyrazol-3-one using inexpensive ammonium chloride catalyst in H\textsubscript{2}O:EtOH at room temperature.
Synthesis of heterocyclic ligands: synthesis, characterization and antimicrobial activity

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A heterocyclic ligand prepared from 1,3,4-thiadiazole moieties in alcoholic medium. Synthesized heterocyclic ligand is characterized quantitatively and qualitatively by using elemental analysis, UV–Vis, FT-IR spectroscopy, mass spectroscopy, 1H NMR & 13C-NMR, and molar conductance measurement. The preliminary in vitro antibacterial and antifungal activity showed that heterocyclic ligand show the moderate activity against tested bacterial Strains S. aureus and B. subtilis and fungal strains of F. Oxysporum and A. Niger using Kirby-Bauer disc diffusion method.

A heterocyclic ligand prepared from 1,3,4-thiadiazole moieties in alcoholic medium. Synthesized heterocyclic ligand is characterized quantitatively and qualitatively by using elemental analysis, UV–Vis, FT-IR spectroscopy, mass spectroscopy, 1H NMR & 13C-NMR, and molar conductance measurement. The preliminary in vitro antibacterial and antifungal activity showed that heterocyclic ligand show the moderate activity against tested bacterial Strains S. aureus and B. subtilis and fungal strains of F. Oxysporum and A. Niger using Kirby-Bauer disc diffusion method.

Synthesis and antidiabetic activity of thiazolidinone–thiophene conjugates

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The title compounds 5-aryl-2-(phenylamino)-5-(thiophen-3-ylmethylene)thiazol-4(5H)-ones (3a-i) were synthesized by reacting with 2-thiophene carbaldehyde (I) and 2-(arylamino)-thiazol-4-one (2a-i) in alcohol and sodium acetate medium. The new compounds were established on the basis of spectral data. In-Vitro antidiabetic activity was carried out by alpha amylase and alpha glucosidase assay methods. Some of the tested compounds showed good antidiabetic activity.
Synthesis, characterization and biological screening of mixed ligand complexes derived from oximes of 2-acetylfuran and 2-acetylthiophene using transition metals

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Present work deals with synthesis, characterization and biological screening of some mixed ligand transition metal complexes derived from 2-Acetylfuran and 2-Acetylthiophene using transition metal viz. Zn(II), Cu(II), Co(II), Ni(II) and Mn(II). The synthesized complexes have been characterized on the basis of spectral techniques such as IR, 1H-NMR and elemental analysis. The biological screening performed on derived complexes reflected that all these complexes show quite appreciable activity against the pathogens Bacillus subtilis, Escherichia coli, Pseudomonas diminuta, Staphylococcus aureus and Candida albicans.

**Figure 1(a & b).** Antibacterial activity of Mixed Ligand metal complexes (Y-axis signifies –log MIC data in μg/ml)

**Figure 2.** Anticandidal activity of [Ni(C12H14N2O3S)Cl2] (PC: Positive Control; NC: Negative Control; Conc. 0.5X: 5mg/ml; Conc. 1X: 10mg/ml)
A New Heterogeneous Catalyst Synthesis using Triethylamine As Template

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Room temperature synthesis of mesoporous aluminophosphate (MAP) using triethylamine as a template by the simple method without an autoclave. Texture, crystallinity, and thermal stability is verified by physicochemical characterization.

Green and efficient, one-pot syntheses of 2-(1H-benzo[d]imidazol-2-yl)-N-(pyridin-4-yl)benzamide

Ganapathi Velupula*a,b, T. Ravi Prasadc, Krishna Reddy Vallurub, Sreedhar Maroju*

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Green and efficient, one-pot three component syntheses of 2-(1H-benzo[d]imidazol-2-yl)-N-(pyridin-4-yl)benzamides have been developed by combining benzene-1,2-diamine with diethyl phthalate & pyridin-4-amine in the presence of phosphoric acid in water at 95-100 °C. These reactions provide excellent yields, involve easy workup and use water as solvent which are the merits of this preparation.
Investigation on design, green and conventional synthesis, characterization, electrochemical and biological studies of some new azomethines and their vanadium (V) complexes

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Synthesis of some new Vanadium (V) complexes of biologically potent (N=O and N=S) donor azomethines by classical thermal and microwave-irradiation techniques and characterized by the elemental analysis, IR, UV and EPR spectral and X-ray powder diffraction studies.

Where: R: OH3C & Cl
And X: O & S
Paper-11

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236 An efficient three-component one-pot synthesis of pyrimidobenzimidazole derivative

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A simple, clean and convenient one pot method has been developed for the synthesis of pyrimido[1,2-a]benzimidazole derivatives by the multicomponent reaction of cyclic ketone (1) aminobenzimidazole (2) and malononitrile (3) in the presence of ammonia as a mild, cheap, efficient, commercially available, environmentally benign, non-toxic base in aqueous ethanol medium. The simple work-up procedure and good to very good yield in short time are some of the important features of this protocol. The chemical structures of the synthesized compounds were characterized by IR, \textsuperscript{1}H NMR, \textsuperscript{13}C NMR and mass spectral analysis.

\begin{center}
\begin{tikzpicture}
\node at (0,0) {\textbf{1(a-c) + R}_{1,2,3} + \textbf{3}}; \\
\node at (0,-2) {\textbf{1}}; \\
\node at (2,-2) {\textbf{1b}}; \\
\node at (4,-2) {\textbf{1c}}; \\
\node at (0,-4) {\textbf{2(a-b)}}; \\
\node at (2,-4) {\textbf{2}}; \\
\node at (4,-4) {\textbf{2}}; \\
\draw[dashed] (0,-2) -- (0,-4); \\
\draw[dashed] (2,-2) -- (2,-4); \\
\draw[dashed] (4,-2) -- (4,-4); \\
\end{tikzpicture}
\end{center}

Paper-12

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Preparation and characterization of organic nanoparticles of novel heterocyclic compounds

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A novel heterocyclic compound, 4-((1H-naphtho[1,8-de][1,2,3]triazin-1-yl)sulfonyl)-N-(1-(5-phenyl-1,3,4-oxidiazol-2-yl)prop-1-en-2-yl)aniline(NTOD) has been designed and synthesized. Colloidal spherical and rod like shape of nanoparticles in aqueous media have been synthesized using reprecipitation method without using any surfactant. The optical properties of the aggregation of nanoparticles was characterized by microscopic characterization showed the size, shape of the nanoparticles.
Zinc oxide Catalyzed, Environmentally Benign Protocol for the synthesis of substituted carboxylic acid

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Carboxylic acid act as a versatile precursor to synthesize biologically valuable molecule like amide, acid chloride and many more. Hence, we have developed convenient method to synthesized substituted carboxylic acid. The previous synthetic method found limitations regarding the use of hazardous solvent, tedious work-up, slow and moderate product yields. To over come, these lacunas herein we have developed a facile and highly efficient synthetic protocol for the synthesis of carboxylic acids from the reaction of substituted aldehydes and hydrogen peroxide (70%) with zinc oxide (10% mol) as a catalyst and in onion extract. Reported method is better substitute for the existing previous methods because it has many advantages such as easy work-up, reduces the reaction time in just 1-2 hours with excellent yield and most important the Zinc oxide easily removed with filtration.

\[
\text{CHO} + \text{ZnO} \xrightarrow{\text{HO-OH}} \text{HO-}\]

An Easy, Efficient Synthesis and Antimicrobial Activity of 5-Aryl-1’-phenyl-3’-(pyridin-3-yl)-3,4-dihydro-1’H,2H-3,4’-bipyrazoles

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An easy, efficient Michael addition reaction condition developed for a novel series pyridinyl-bipyrazole derivative using chalcone derivatives and hydrazine hydrate in the presence of acetic acid as catalyst. The screening result of antimicrobial activity of the title compounds showed moderate to good results compared to their standards.

12 examples
Synthesis of thiazole derivatives containing indole moiety bearing -4-oxazetidinone

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Schiff base synthesis of thiazole derivatives containing Indole moiety bearing 4-oxazetidine ring includes the condensation of (E)-5-((1H-indol-1-yl)methyl)-N-ethylidene-1,3,4-thiadiazol-2-amine with chloroethylacetate in presence of TEA/DIOXANE to obtain1-(5-((1H-indol-1-yl)methyl)-1,3,4-thiadiazol-2-yl)-3-chloro-4-methylazetidin-2-one, this reaction was subjected to schiff base reaction. The structure of these newly synthesized compounds were characterised by 1H NMR,13CNMR ,Mass ,IR, and elemental analysis.

![Reaction Scheme](image)

Synthesis and docking studies of 2-(3-bromophenyl)-7-hydroxy pyrazolo [1,5-a]pyrimidine-6-carbonitrile

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![Reaction Scheme](image)
Synthesis, characterization, microbial evaluation of mixed ligand complexes derived from hydrazones of cyclohexanone and benzophenone using transition metal ions

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The chemical interaction of 2,4-dinitrophenylhydrazones of Cyclohexanone and Benzophenone with chlorides of transition metals i.e.; Mn(II), Co(II), Ni(II), Cu(II) and Zn(II) resulted in mixed ligand complexes of the type \([\text{M(C}_3\text{H}_2\text{N}_8\text{O}_8)(\text{H}_2\text{O})_2\text{Cl}_2}\]. The hydrazones were prepared using green synthetic route by avoiding conc. \(\text{H}_2\text{SO}_4\). Novel mixed ligand complexes have been analyzed, characterized and compared with parent ligands on the basis of chemical analysis and spectral studies. The antimicrobial activities carried out on bacterial strains *Escherichia coli*, *Bacillus subtilis*, *Staphylococcus aureus* and fungal strain *Candida albicans* showed the appreciable activity of all these complexes against these strains.

**Figure 1.** Antimicrobial activities of the synthesized mixed ligand complexes

**Figure 2.** Probable coordination for the synthesized mixed ligand complexes
Synthesis of Pharmacologically Important Analogues of Natural Tryptanthrins

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Eco-friendly synthesis of Imidazo[4,5-b]pyridine containig-1,3,5-triazinane-2-thiones

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Thiazole derivatives containing compounds as curative agents for Tuberculosis: A Review

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This review investigates the recent developments in the synthesis of thiazole derivatives & evaluates their biological importance towards Tuberculosis disease.