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Graphical abstract

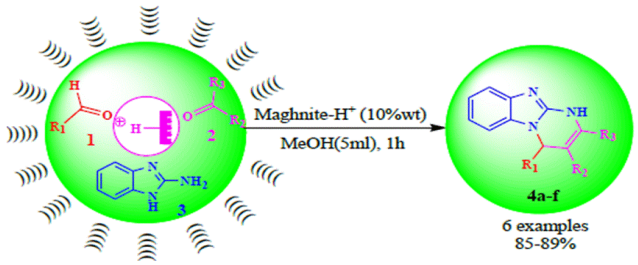
Paper-1	Heterocyclic Letters 13: iss.-3 (2023), 449-457

An eco-friendly ultrasound-assisted one-pot three-component synthesis of 1,4-dihydropyrimido[1,2-*a*]benzimidazole derivatives Catalyzed by maghnite-h$^+$

Hadda Ben messaoud[1*], Boumadiene Benlahreche[1,2], Amar Djemoui[1], Lahcene Souli[1] and Mokhtar Boualem Lahrech[1*]

[1]*Laboratory of Organic Chemistry and Natural Substance, Faculty of Exact Sciences and informatics, Ziane Achour University-Djelfa, Algeria.*
[2]*Laboratory of Fine Chemistry, Department of Chemistry, Faculty of Exact and Applied Sciences, University of Oran1 Ahmed Ben Bella, PB 1524 El M'naouer, Algeria.*
**Corresponding Author. E-mail: lahrechmokhtarboualem@yahoo.fr; haddabenmessaoud2@gmail.com*

An efficient and easy procedure is developed for the synthesis of 1,4-dihydropyrimido[1,2-a]benzimidazole derivatives (DHPBz) in good yields, via one-pot multi-component reaction of an aromatic aldehydes, ketones and 2-aminobenzimidazole, catalyzed by a proton exchanged Algerian montmorillonite clay (MMT-H$^+$) as green catalyst under ultrasound irradiation.



Paper-2	Heterocyclic Letters 13: iss.-3 (2023), 459-466

Esterification of Benzoic Acid over Zinc Incorporated Solid Acid Catalyst

J. Clara Jeya Geetha[a], M.Balavinoth[a], M.R. Devi[b] and J.Ilavarasi Jeyamalar[a]*

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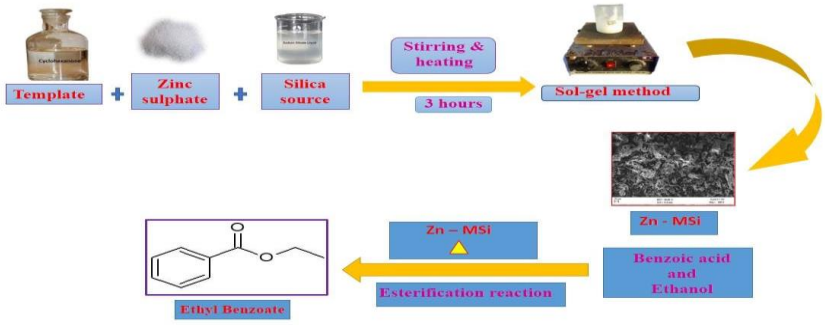
[b]*Department of Chemistry, Sree Devi Kumari Womens College, Kuzhithurai, 629163, Tamilnadu, India*



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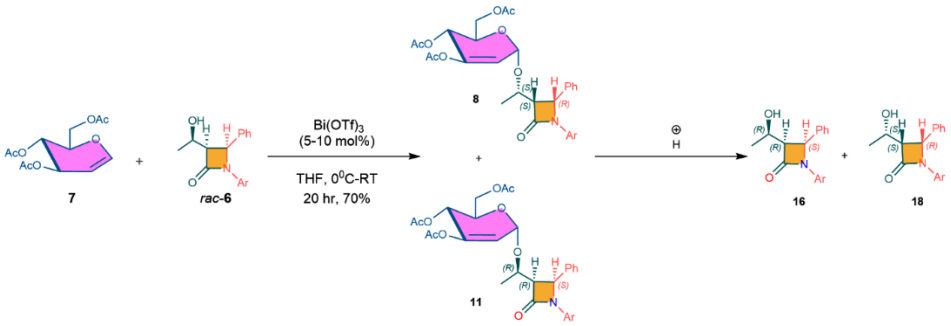
Paper-3	Heterocyclic Letters 13: iss.-3 (2023), 467-475

Stereospecific Glycosylation: A Carbohydrate Chiron for Optical Resolution

Ram Naresh Yadav,[1] Aparna Das[3], Ashok Kumar Srivastava[1] and Bimal K. Banik*[2,3]

[1]Department of Chemistry, Faculty of Engineering & Technology, Veer Bahadur Singh Purvanchal University, Jaunpur-222003 (U.P.) India, [2]Department of Molecular Pathology, University of Texas M. D. Anderson Cancer Center,1515 Holcombe Blvd, Houston, Texas 77030, USA; [3]Department of Mathematics and Natural Sciences, College of Sciences and Human Studies, Deanship of Research, Prince Mohammad Bin Fahd University, Al Khobar 31952, KSA; Email: bimalbanik10@gmail.com; bbanik@pmu.edu.saderived

The utilization of bismuth triflate in the Ferrier glycosylation of racemic β-lactam-derived lithium enolate base represents a formal [2+2] cycloaddition annulation strategy in the synthesis of the side chain of Thienamycin antibiotics. This reported method offers a highly convenient and high-yielding approach for achieving this crucial target.



Paper-4	Heterocyclic Letters 13: iss.-3 (2023), 477-488

Synthesis and study of anticancer activity of quinoline derivative using computational chemistry

R. Pandey[a], A. Asrondkar[b], D. Nair[a], K. Chaurasiya[b], C. Kamath[a*]

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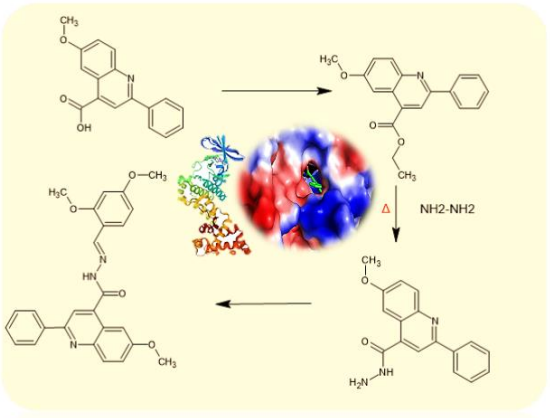
[b]Haffkine Institute for Training, Research & Testing, Parel, Mumbai, Maharashtra, India
**Corresponding author Email: chitra@somaiya.edu*

Heterocyclic reaction scheme for the synthesis of a Quinoline-4-carboxylic acid derivative using Isatin and computational evaluation of its anticancer activity



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Paper-5	Heterocyclic Letters 13: iss.-3 (2023), 489-503

Identification of substituted 4, 7-dihydroy-8-(4-methyl-1h-benzo [b] [1, 4] diazepin-2-yl)-3-phenyl-chromen-2-one analogues as antimicrobial agents, molecular docking and pharmacokinetic evaluation

Nalla Umapathi[a], Thumma Vishnu[b], Matta Raghavender[c] and Pochampally Jalapathi[c*]

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[b]*Department of Sciences and Humanities, Matrusri Engineering College, Hyderabad, Telangana, 500059, India*
[c]*Department of Chemistry, Osmania University, Hyderabad, Telangana, 500007, India*
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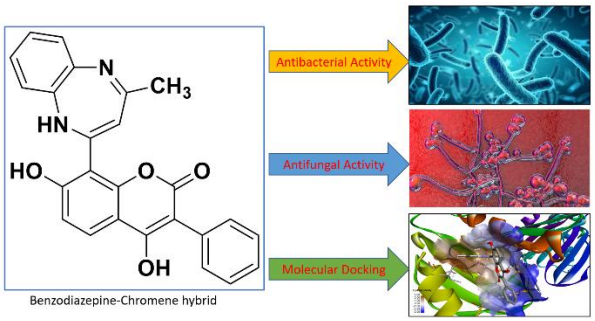
Antimicrobial activity of a set of eleven (11) substituted benzodiazapine- chromene-2-ones bacteria and fungal species. Docking analysis was accomplished to expertise the formational features and binding mechanism of synthesized different 4, 7-Dihydroy-8-(4-Methyl-1h-Benzo [B] [1, 4] Diazepin-2-yl)-3-phenyl-chromen-2-one analogues and were docked against the structures of *Staphylococcus aureus* DNA gyrase (PDB ID: 3G7B) and *Candidapespsin-5* through *Candida albicans* (PDB ID: 2QZX). All synthesized derivatives had shown interactions with binding energies. Pharmacokinetic evaluation results indicate the compounds possess drug-likeness properties.

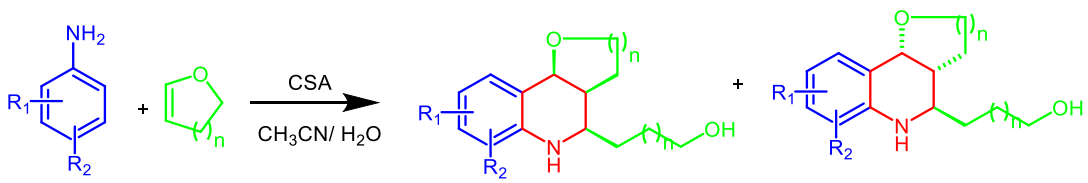


Paper-6	Heterocyclic Letters 13: iss.-3 (2023), 505-514

Application of Multicomponent Reactions for Construction of Quinoline Derivatives

Anand Mohan Jha

Department of Chemistry, M. L. S. M. College Darbhanga (A constituent unit of L. N. Mithila University Darbhanga) Bihar, India.
Email: amjha6182@gmail.com



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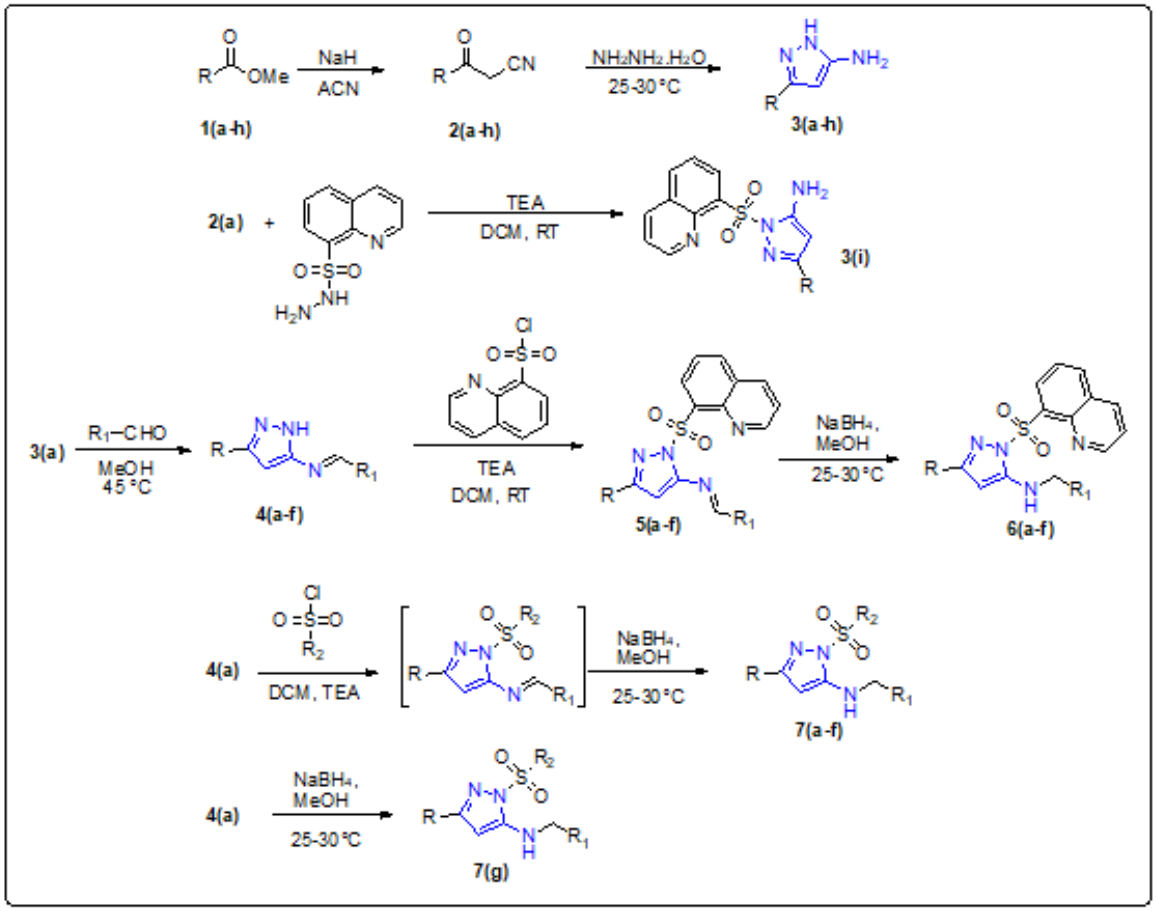
Paper-7	Heterocyclic Letters 13: iss.-3 (2023), 515-523

"Microwave assisted solvent free synthesis 3-aryl-1H-pyrazol-5-amines from benzoylacetonitrile and its reactions."

Mahesh P More[a], Anil B Solunke[a], Sandip U Agare[a], and Tanuja V Kadre[a]*.

[a]*Department of Chemistry, Dr. A. P. J. Abdul Kalam University, Indore, Madhya Pradesh, India 452016.*
**Correspondence Author Email: tanujavkadre@gmail.com*

Synthesis of a series of 3-aryl-1H-pyrazol-5-amines from benzoylacetonitrile under microwave irradiation and their exploration are described in the present article. The benzoylacetonitrile are irradiated under microwave with hydrazine hydrate at 80 °C for 10 min. to afford desired 3-aryl-1H-pyrazol-5-amines. 3-phenyl-1H-pyrazol-5-amine subsequently treated with substituted aromatic aldehydes to afford corresponding substituted (E)-N-benzylidene-3-phenyl-1H-pyrazol-5-amine which on treatment with diversified sulfonyl chloride followed by reduction in presence of sodium borohydride to afford 1-sulfonated N-benzyl-3-phenyl-1H-pyrazol-5-amines derivatives.



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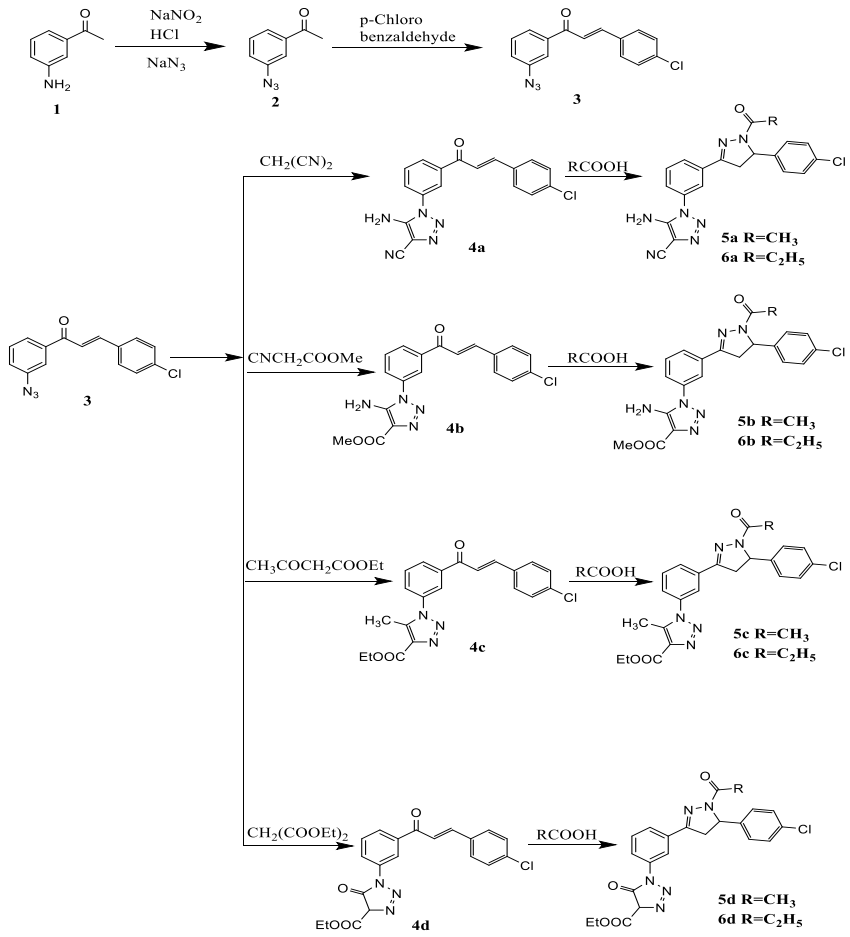
Paper-8	Heterocyclic Letters 13: iss.-3 (2023), 525-531

Synthesis of derivatives of 1-(3-(3-(1H-1,2,3-triazole-1-yl) phenyl)-4,5-dihydro-1H-pyrazol-1-yl) ethanone from 3-amino acetophenone

Ratnamala Sonawane[a], Mohan Sagare[b], Satyabhama Vishwakarma[c]

[a, b] *Department of Chemistry, Institute of science, Homi Bhabha State University, Mumbai-32, Maharashtra, India. Email: sagaremohan@yahoo.in*



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Paper-9	Heterocyclic Letters 13: iss.-3 (2023), 533-538

One- step multi component synthesis of highly substituted pyridine derivatives using barium oxide nanoparticles as catalyst

Neha H. Deore[a], Rutuja Patila, Bhavna Yeotikar[a], Ravi S. Balaskar[b] and Amol H. Kategaonkar[c]*

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[b]Department of Chemistry, K.E.S's, Pratap College, Affiliated to North Maharashtra University, Jalgaon (MS) India
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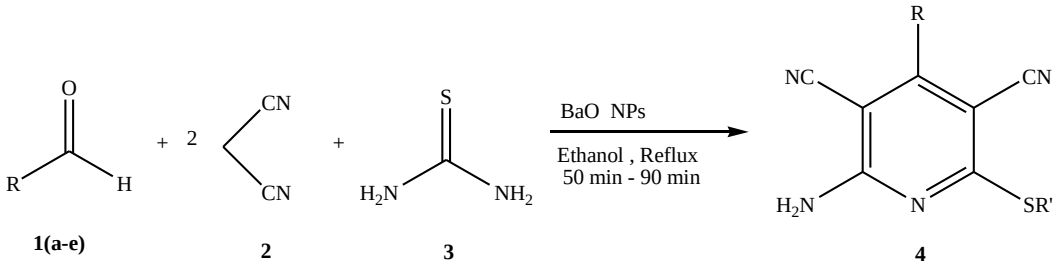
In one pot multicomponent synthesis of 2-amino,3,5-dicyno,4-aryl-6-sulfanylpyridine is 'Privileged medicinal Scaffold' this reaction has been indicated via multicomponent reaction of aromatic aldehyde, malononitrile as active methylene group and thiourea using Barium oxide nanoparticles as catalyst. The BaO NPs as a catalyst is a very effective base catalyst in small amounts. Excellent yields in a short time were obtained of the products.



1(a-e) **2** **3** **4**

Paper-10	Heterocyclic Letters 13: iss.-3 (2023), 539-552

Modeling & analysis of NMR, UV-Vis and MS spectra for the characterization of the compound Narcissin

Messaouda ALLAOUI[1,2], Oumelkheir RAHIM[3*], Oumelkhir BELMAABDI[3], Ben Aissa yousef[1] & Cheriti Abedlkrim[4]

[1] VPRS Laboratory, Chemistry Department, Faculty of Mathematics and Matter Sciences. University of KASDI Merbah, Ouargla 30000, Algeria.
[2] Biogéochimie des Milieux Désertiques, Chemistry Department, Faculty of Mathematics and Matter ScienceUniversity Kasdi Merbah, Ouargla 30000, Algeria
[3] Pollution & Waste Treatment Laboratory, Chemistry Department, Faculty of Mathematics and Matter Sciences, University Kasdi Merbah, Ouargla 30000, Algeria.
[4]Phytochemistry & Organic Synthesis Laboratory, University of Bechar, 08000 Algeria.

The separation of certain compounds from the butanol extract resulted in the isolation of several types of products, the most common of which are flavonoids that are the subject of phytochemical and pharmacological studies. This work allowed several spectroscopic analyses to be carried out to determine and suggest the structure of the resulting pure materials. So, the main objective of this project is to analyses the different spectral arrays to prove and predict the structure and modeling of the molecule and define their QSAR descriptors.

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Paper-11	Heterocyclic Letters 13: iss.-3 (2023), 553-562

Kinetic study of substituted benzimidazole synthesized *via* phase transfer catalysis

Manisha Sharma[1,*], Deepankar Sharma[1]

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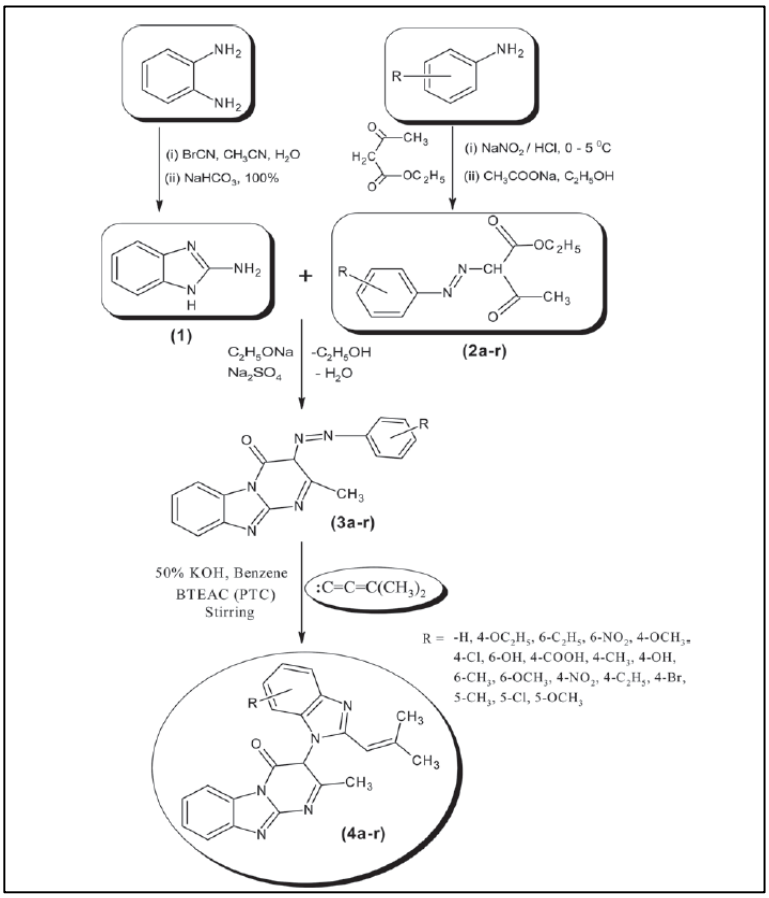
E-mail: sharmamani21@gmail.com

The interaction of a substituted carbene with azo analogue was studied to obtain benzimidazole derivative under kinetically controlled phase transfer catalysis conditions. In situ generation of dimethylvinylidene carbene was facilitated by the interaction between 3-chloro-3-methyl-1-butyne and alkali at the interface. Interestingly, insertion of this carbene into the N=N linkage of 2,4-dimethyl-3-arylazo-6-thiopyrimidine afforded newly synthesized desired benzimidazolopyrimidines. The reaction follows the pseudo-first order rate law. Rational mechanism of the reaction is proposed according to the experimental evidence. The compounds were synthesized in excellent yields (70–80%) and their structures were established based on their IR and ^{1}H-NMR spectral data.



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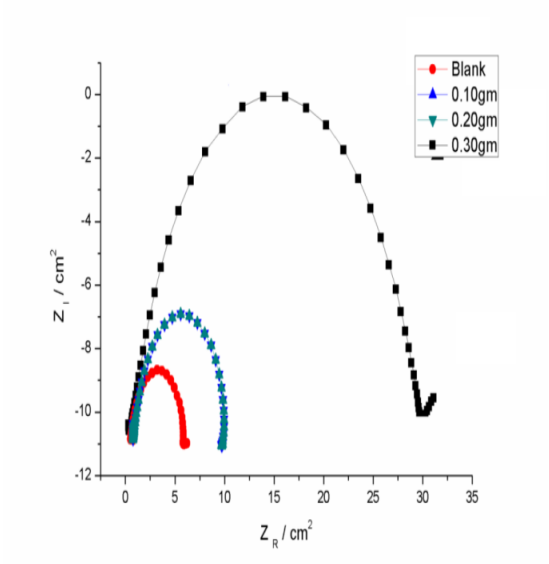
Paper-12	Heterocyclic Letters 13: iss.-3 (2023), 563-571

Corrosive behavior of Iron alloy with variable oxygen Concentration in presence of inorganic acidic medium

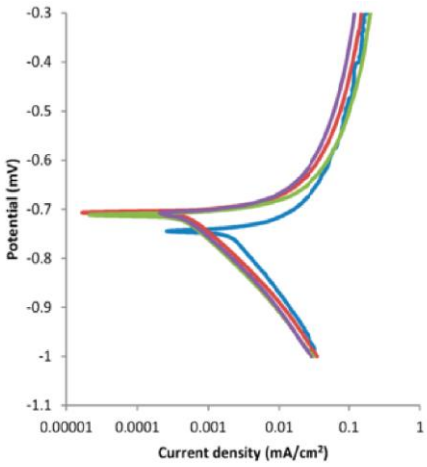
Ganesh D. Thorat

Department of Chemistry, Shri Shivaji Science & Arts College Chikhli Dist. Buldana, India
Email:-*thoratganesh9@gmail.com*

Studied iron alloy by Non electrochemical techniques (weight loss method) and electrochemical techniques ininorganic acidic medium.Corrosion current decreases and corrosion potential increases progressively it means that corrosion of iron are decreases in inorganic acidic medium in presence of corrosive inhibitor, and electrochemical impedance spectroscopy the charge transfer resistance increases and double layer capacitance decreases continuously it means that the corrosion rate of iron can be decreases in inorganic acidic medium in presence of corrosive inhibitor.



Polarization curves for Iron



Electrochemical impedance Spectroscopy

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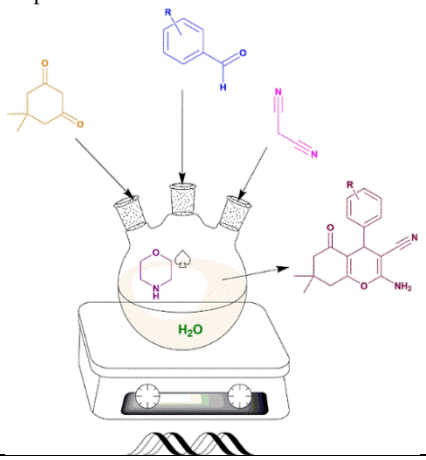
Paper-13	Heterocyclic Letters 13: iss.-3 (2023), 573-582

Ultrasound assisted synthesis and characterization of carbonitrile bearing pyran derivatives and it's antimicrobial activity

Prakashbhai V. Bishnoi [a*], Jasmin H. Kumbhani [b] and Parimal M. Chatrabhuji [a]

[a] *Pramukh Swami Science & H D Patel Arts College, Kadi-382715, Gujarat, India*
[b] *M B Patel Science College, Anand, S P University, VV Nagar-388001, Gujarat, India*
**Correspondence: bishnoichemistry@gmail.com*

Carbonitrile-containing pyran derivatives with an electron-withdrawing substituent (-R) were produced via a one-pot, three-component procedure including a cyclization reaction between malononitrile, diketone, and variously substituted aldehydes with morpholine as a catalyst in aqueous condition in ultrasonic irradiation. By FTIR, ^{1}H NMR, ^{13}C NMR, MASS Spectra, and elemental analyses, the structural development of named derivatives was verified.



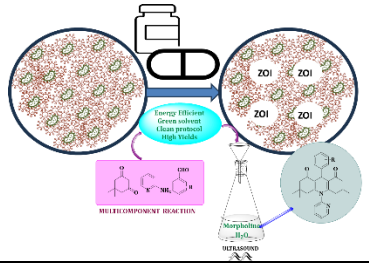
Paper-14	Heterocyclic Letters 13: iss.-3 (2023), 583-590

Optimization study and antimicrobial activity of hexahydroacridine-1,8(2*h*,5*h*)-dione: a promising compound for novel therapeutics

Shweta Patel*, Sarika Patel, Jaymin Parikh

Faculty of Science, Mehsana Urban Institute of Sciences, Department of Chemistry, Ganpat University, Kherva, Mehsana-384012, Gujarat, India
**Correspondence: shwetap874@gmail.com*

Hexahydroacridine-1,8-dione is a chemical compound that has gained significant attention in medicinal chemistry and drug discovery research. This versatile building block offers a unique molecular structure that serves as a valuable precursor for the synthesis of diverse chemical scaffolds. In this research paper, we explore the synthesis and potential applications of hexahydroacridine-1,8-dione derivatives in the development of novel therapeutic agents. We develop into its pharmacological activities, including antibacterial and antifungal activity. The synthetic derivatives were confirmed using IR, 1H NMR, 13NMR, mass spectra, and elemental analysis. The use of water as a solvent that is believed to be reasonably environmentally beneficial.



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Paper-15	Heterocyclic Letters 13: iss.-3 (2023), 591-601

A method for the desulfurization of substituted thioureas applied to the synthesis of tetrazole and guanidine derivatives

Edalada Venkata Krishna Parvathi,[a] Srinivasa rao Pinapati,[b] Ramana Tamminana,*[c] and Ramesh Raju Rudraraju*[a]

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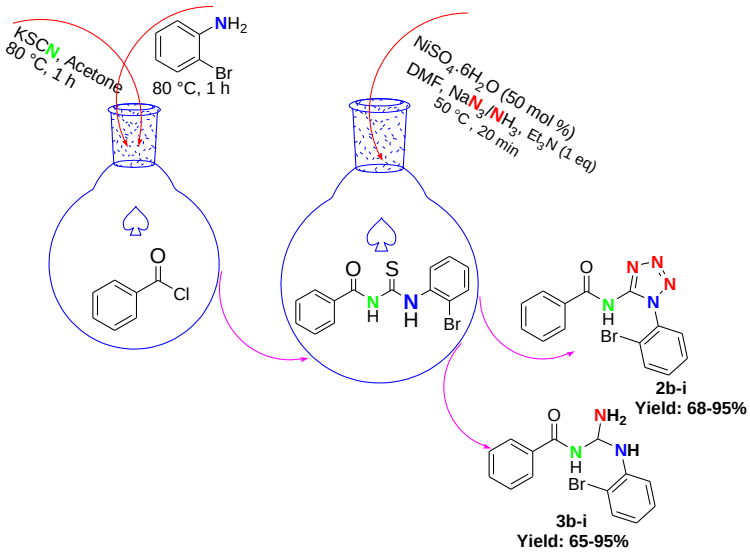
[b] Department of Chemistry, Govt. Degree College, Naidu pet, Nellore Dist. AP- 524126, India, E-mail: pinapatisrinivasarao@gmail.com
[c] Ramana Tamminana, VIT-AP University, Inavolu, Beside AP Secretariat, Amaravati AP, India. E-mail:rtamminana17@gmail.com

We have developed general and simple robust set-up for the efficient desulfurization of a series of thioureas, which generates the corresponding tetrazole and guanidine derivatives in moderate to high yields. This approach enabled the controlled and safe formation of the final products. In addition, we have explored the library of target products using this method.



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REVIEWS

Review No.1	Heterocyclic Letters 13: iss.-3 (2023), 603-626

Advances in chemical synthesis of quinazoline and quinazolinones
Pratyoosh Kumar, Vishwa Deepak Tripathi*

Department of Chemistry, C. M. Science College (A Constituent Unit of L. N. Mithila University Darbhanga), Bihar
Email: vdtmkclnmu@gmail.com

Quinazolinones and Quinazolines are considered to be most important heterocyclic molecules in the pool of biologically active heterocyclic molecules synthesized in literature. The importance is reflected by the large number of biological potential related with the same molecule. The present review is focused on the compilation of the results reported by researchers in the area of synthesis of biologically active quinazoline based heterocyclic molecules. This review is compiled by authors with the intention of summarizing the various synthetic process for the preparation of quinazolines in the order of their catalysts, reaction conditions and solvents.

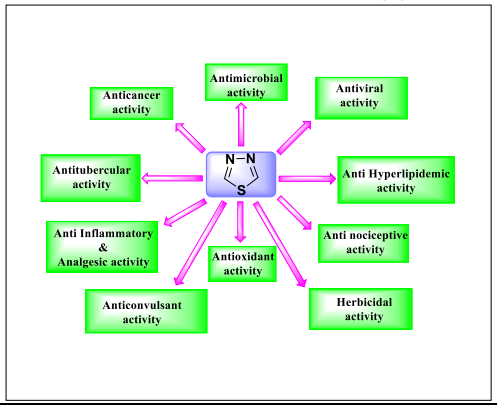
Review No.2	Heterocyclic Letters 13: iss.-3 (2023), 627-641

1,3,4- Thiadiazole and its Potency: A Review

Shweta Patel[1], Sarika Patel[1]*, Hasit Vaghani[1]

[1] Department of Chemistry, Mehsana urban Institute of sciences, Ganpat university, Kherva, Mahesana-384012
E mail: spp04@ganpatuniversity.ac.in

The Thiadiazole & their derivatives shown the number of pharmacological activities as anti-microbial, anti-inflammatory activity, anti-tubercular activity, ant diabetic activity, diuretics, anti-depressant, anti-viral, anticonvulsant, anti-oxidant, analgesic activity, antinociceptive & cytotoxic activity. These thiadiazole are the heterocyclic compound which contain the five-member ring & nitrogen & sulphur. In this paper we mention the recent derivatives of 1,3,4thiadiazole & their activity.



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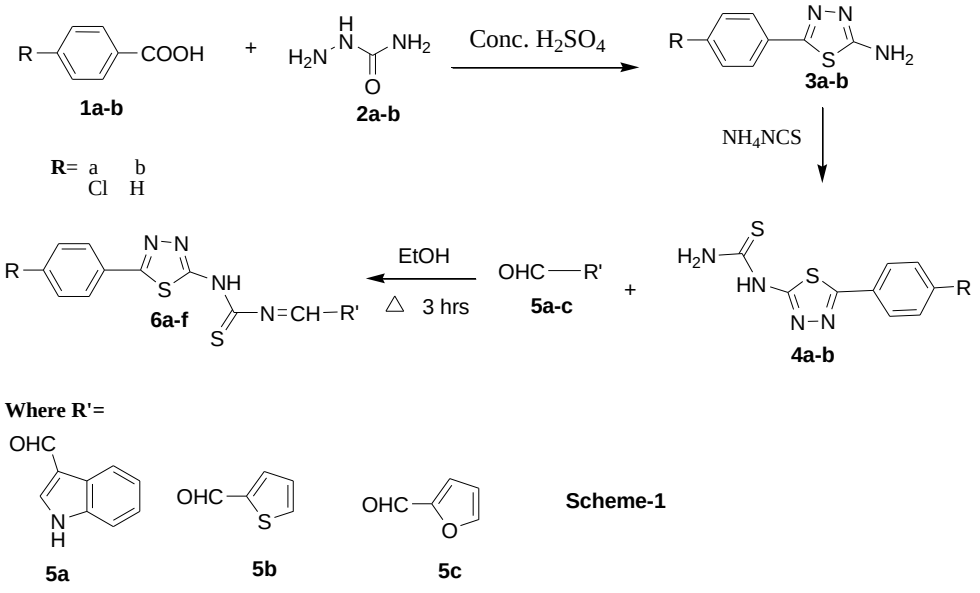
Review No.3	Heterocyclic Letters 13: iss.-3 (2023), 643-665

Design, synthesis and biological evaluation of thiadiazoly schiff bases

[1]Prabhakar W. Chavan*, [2]Prashant C. Hanamshetty, [3]Varunakumara J B, [4]Nagabhushan M M,

*[*1]Department of Post-Graduate Studies and Research in Chemistry, Sahyadri Science College, Kuvempu University, Shivamogga-577203, Karnataka, India, Email:prabhakarchavan7@gmail.com*
[2]Department of Chemistry, Guru Nanak First Grade College, Bidar-585 403, Karnataka, India
[3]Department of Biochemistry, Sahyadri Science College, Kuvempu University, Shivamogga-577203, Karnataka
[4]Department of Chemistry, Govt. Engineering College, Raichur, Karnataka, India

The thiadiazolyl shiff bases were synthesized and characterized by spectroscopic techniques. These newly synthesized molecules were evaluated for antioxidant and antimicrobial activities. The compounds **6a, 6b** and **6c** showed potent antimicrobial activity and antioxidant activities.



Scheme-1