Heterocyclic Letters
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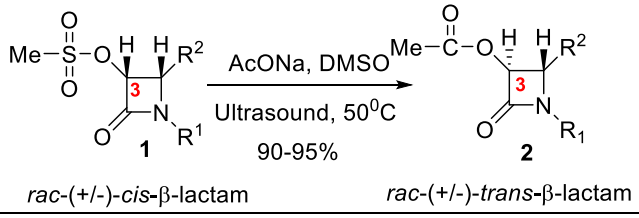
Graphical abstract

Paper-1	Heterocyclic Letters 13: iss.-2 (2023), 241-244

Stereoselective Synthesis of *Trans* Acetoxy β-Lactams Under Sonication

Ram Naresh Yadav,[1] Aarif Latif Shaikh[2] and Bimal Krishna Banik [3*]

[1]Department of Chemistry, Faculty of Engineering & Technology, Veer Bahadur Singh Purvanchal University, Jaunpur Uttar Pradesh; [2]Laxai Life Sciences, Research & Development Centre, Building No.900, MN Park, Synergy Square I, Genome Valley, Shameerpet, Hyderabad – 500078, Telangana, India; [3]Department of Mathematics and Natural Sciences, College of Sciences and Human Studies, Deanship of Research Development, Prince Mohammad Bin Fahd University, Al Khobar 31952, Kingdom of Saudi Arabia; Email: bimalbanik10@gmail.com



Paper-2	Heterocyclic Letters 13: iss.-2 (2023), 245-252

Ultrasound-Assisted Hydrogenation and Hydrogenolysis of Beta-Lactams

Aarif Latif Shaikh[1] and Bimal Krishna Banik[2*]

[1]Sai Life Sciences, DS-7, IKP Knowledge Park, Turkapally, Shameerpet, Medchal, 500078, Telangana, India; [2]Department of Mathematics and Natural Sciences, College of Sciences and Human Studies, Deanship of Research Development, Prince Mohammad Bin Fahd University, Al Khobar 31952, Kingdom of Saudi Arabia; Email: bimalbanik10@gmail.com

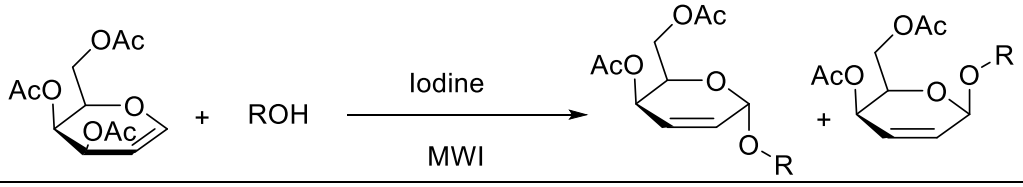
Catalytic transfer hydrogenation reaction was conducted on substituted β-lactams to accomplish synthesis of numerous open chain amides using ultrasound. The reduction of alkene and hydrogenolysis of functional groups were completed rapidly at about 50°C with 10% Pd/C and ammonium formate. β-Lactams were cleaved through hydrogenolysis of the N-C_4 bond with 10% Pd/C in good yield. These techniques described here for ultrasound-assisted hydrogenation reactions are simple, rapid and efficient.

Paper-3	Heterocyclic Letters 13: iss.-2 (2023), 253-256

Microwave-Induced Iodine-Catalyzed Glycosylation of Alcohols with Glycals

Ram Naresh Yadav,[1] Aarif Latif Shaikh,[2] and Bimal Krishna Banik [3, 4*]

[1]Department of Chemistry, Faculty of Engineering & Technology, Veer Bahadur Singh Purvanchal University, Jaunpur Uttar Pradesh; [2]Laxai Life Sciences, Research & Development Centre, MN Park, Synergy Square I, Genome Valley, Shameerpet, Hyderabad-500078, Telangana, India; [3]The University Texas M. D. Anderson Cancer Center, USA; [4]Department of Mathematics and Natural Sciences, College of Sciences and Human Studies, Deanship of Research Development, Prince Mohammad Bin Fahd University, Al Khobar 31952, Kingdom of Saudi Arabia; Email: bimalbanik10@gmail.com



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Paper-4 | Heterocyclic Letters 13: iss.-2 (2023), 257-267

A Green synthesis of Indole derivatives in Water : Reaction of Indole -2,3- diones with 5,6 Diamino-1,3-dimethyl-2,4(1*H*,3*H*)pyrimidinedione hydrochloride and evaluation of Actibacterial Activity

Kanti Sharma* and Lokesh Kumar Sharma

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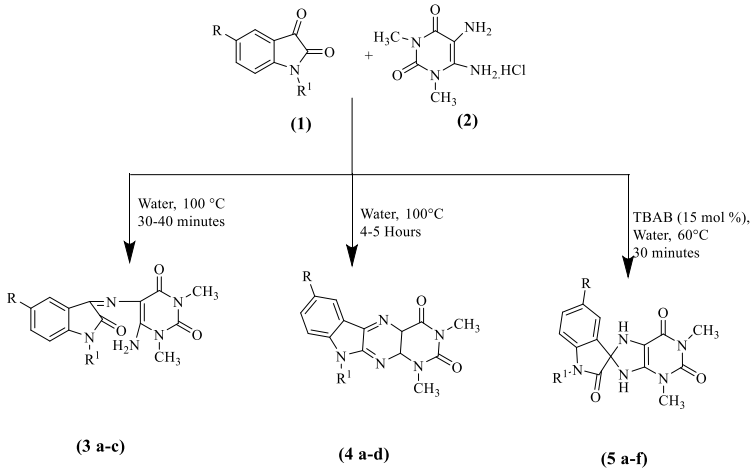
The reactions of indole-2,3-diones (**1**) with 5,6- diamino-1,3-dimethyl-2,4-(1*H*,3*H*) pyrimidinedione hydrochloride (**2**) have been investigated. The structure of the synthesized compounds were characterized by their spectral (IR, ^{1}H-NMR, ^{13}C-NMR, Mass) and analytical data. The synthesized compounds were evaluated for antibacterial activity against *B. subtilis*, *S. aureus*, *E. coli* and *P. aeruginosa* bacteria.

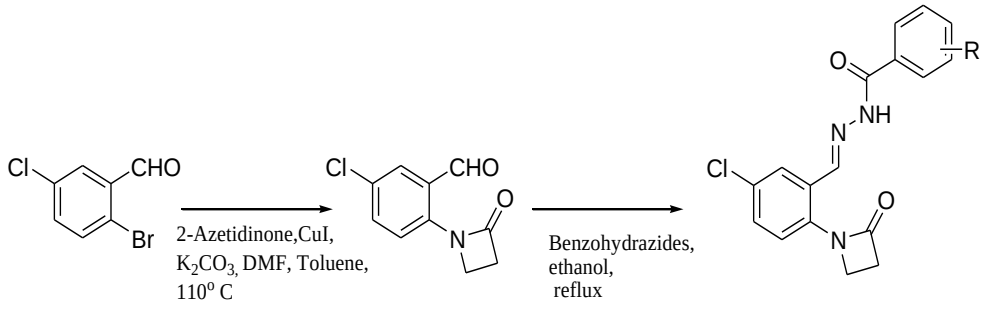


Paper-5 | Heterocyclic Letters 13: iss.-2 (2023), 269-279

Synthesis, Characterization and Antibacterial Bioassay and Molecular Modeling Studies of Novel (E)-N-(5-chloro-2-(2-oxoazetidin-1-yl)benzylidene)benzohydrazide Derivatives.

Surekha Pothu[a,b], Srinivasa rao Vankadari[a], Ram Bhavani[c], Balram Bhavani[c], Guguloth Ravi[a], Parthasarathy Tigulla[a]*

[a]*Osmania University, Chemistry department, TS, India.*
[b]*Government Degree College,Vidyanagar, Hyderabad.*
[c]*Green Evolution Laboratories, Wangapally village, Nalgonda-500085, TS, India.*



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Paper-6	Heterocyclic Letters 13: iss.-2 (2023), 281-287

Synthesis, Characterization And Antimicrobial Studies of Selected Transition Metal Complexes Derived From Benzotriazole Ring with Thiosemicarbazones

Sandip D. Patel*, Mohit R. Joshi, Dr. Harshad P. Patel

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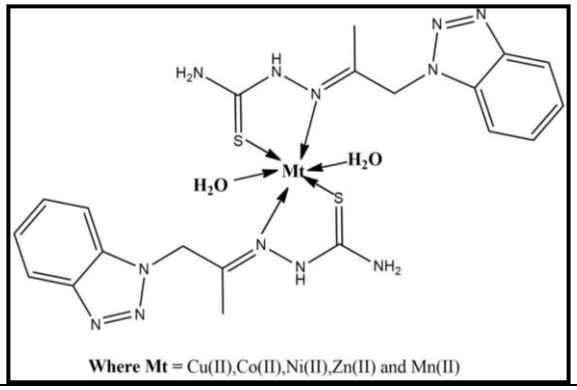
Email: *sandippatel77790@gmail.com*

The novel ligand, (2-(1-(1H-benzo[d][1,2,3]triazol-1-yl)propan-2-ylidene) hydrazine carbo thioamide(BTTS) was synthesised from thiosemicarbazide and 1-(1H-benzo[d][1,2,3]triazol-1-yl)propan-2-one. The reaction between novel ligand with selected Transition Metal salts (Cu(II), Co(II), Ni(II), Mn(II) and Zn(II)) yielded their metal complexes of BTTS. The characterization like elemental contents, Spectral studies, metal: ligand ratio and magnetic properties of novel ligand and their metal complexes were carried out. Antibacterial Activity of ligand and its all metal complexes shows good activities.



Paper-7	Heterocyclic Letters 13: iss.-2 (2023), 289-296

"Synthesis, Characterization and Anti-Microbial Study of Heterocyclic Schiff Base Ligands of 3-Acetyl 4-Hydroxy Quinolin-2-One"

S. Anjanikar[1], S. Chandole[*2]

[1] Department of Chemistry, Sharadchandra College, Naigaon, 431709, Maharashtra, India.
**[2] Department of Chemistry, S.G.B. College, Purna Jn., 431709, Maharashtra, India.*
** Corrosponding author email: schandole@reddifmail.com*

New Schiff bases synthesized by condensation of 3-acetyl 4-hydroxy quinolin-2-one. These Schiff bases were characterized by spectral techniques and screened for antibacterial and antifungal activity.

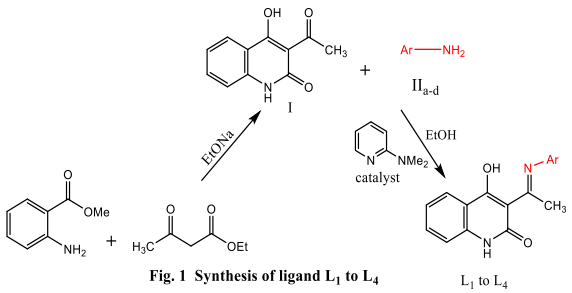


Fig. 1 Synthesis of ligand L_1 to L_4

II a Ar = pyridin-2-amine, **II b Ar** = pyridin-3-amine,

II c Ar =Pyridin-4-amine **II d Ar** =5-Chloropyridin-2-amine,

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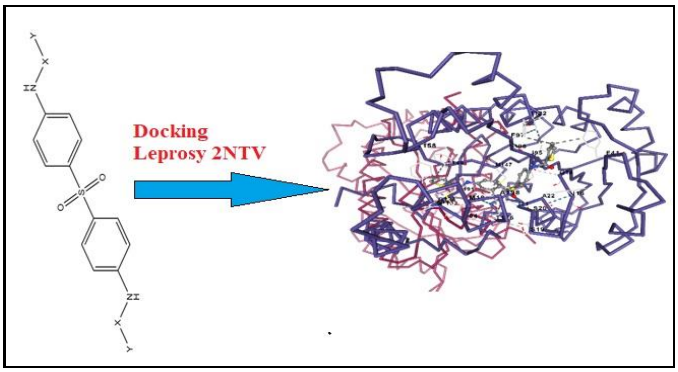
Paper-8 | Heterocyclic Letters 13: iss.-2 (2023), 297-302

Studies in designing of dapsone derivatives as potential mycobacterium leprae enoyl acyl reductase inhibitors in silico approach

Prasanna B. Ranade* Dinesh N. Navale, Ubaidullah A. Anware, Dheeraj M. Negi, Chhaya C. Jajoriya, Pooja P. Mane

Department of Chemistry, Vivekanand Education Society's College of Arts, Science and Commerce, (Autonomous), Chembur Mumbai 400 071 INDIA.
Corresponding Author
prasannaranade@yahoo.com



Paper-9 | Heterocyclic Letters 13: iss.-2 (2023), 303-309

Antibacterial evaluation of some benzimidazole azomethine derivatives synthesized *via* greener approach

Vijay Kumar Yadav[1,*], Meena Bhandari[1], Ashutosh K. Gupta[2]

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[2]R&D, Redox Scientific Plot No. 20, Sopan Kesar Industrial Estate, Moraiya, Nr. Changodar, Ahmedabad 382213, Gujarat, India.
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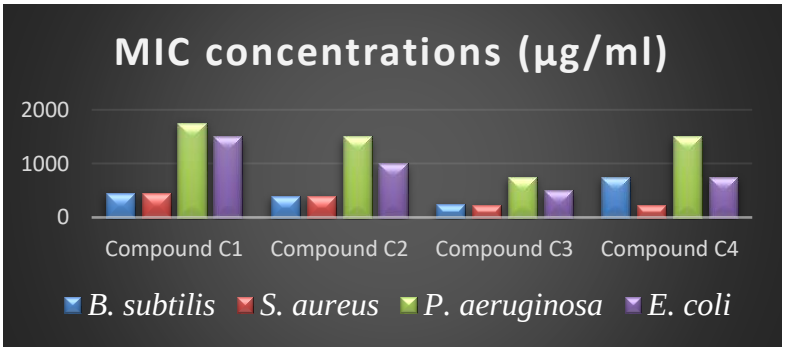
The interaction of substituted Benzimidazole (**A1, A2**) and aromatic aldehyde (**B1, B2**) *via* a greener approach resulted in the synthesis of azomethine derivatives (**C1 – C4**). The compounds **A1** and **A2** were synthesized using phenylenediamine and respective carboxylic acids using aqueous media. The resultant compounds were characterized by elemental analysis, ^{1}H-NMR and IR spectral studies.
The *in-vitro* Antibacterial activities of the final compounds have proven that they are active against the bacterial strains (*B. subtilis*, *S. aureus*, *P. aeruginosa* and *E. coli*) incorporating microdilution method.



Antimicrobial activities of synthesized compounds C1-C4

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Paper-10	Heterocyclic Letters 13: iss.-2 (2023), 311-318

Iron(iii) nitrate catalysed one-pot synthesis of 2,3-disubstituted quinazolinones by coupling of 2-bromo benzamide, benzaldehyde and ammonia

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***Corresponding Author E-mail:** chemthrivenivsu@gmail.com*

Heterocyclic compounds are commonly used Scaffolds on which pharmacophores are arranged to provide potent and selective drugs. This is especially true for six-membered ring heterocyclic compounds, which serve as the core components of many substances that possess a wide range of interesting biological activities. In this study, a series of Quinazolinone derivatives was designed and synthesized. The desired products were isolated in moderate to excellent yields in the presence of Iron(III) nitrate. The present protocol shows some specific advantages such as mildness, short reaction times. The chemical structures of the synthesized compounds were confirmed by ^{1}H NMR, ^{13}C NMR and mass spectral studies.

Graphical Abstract

Paper-11	Heterocyclic Letters 13: iss.-2 (2023), 319-329

Synergistic effect of Ethyl lactate/GVL: A new route for the synthesis of Spirooxindole-indazolones and its derivatives

Smriti Kushwaha,[a] Jyoti Baranwal,[a] Swastika Singh[a] and Archana Jyoti *[a][a]

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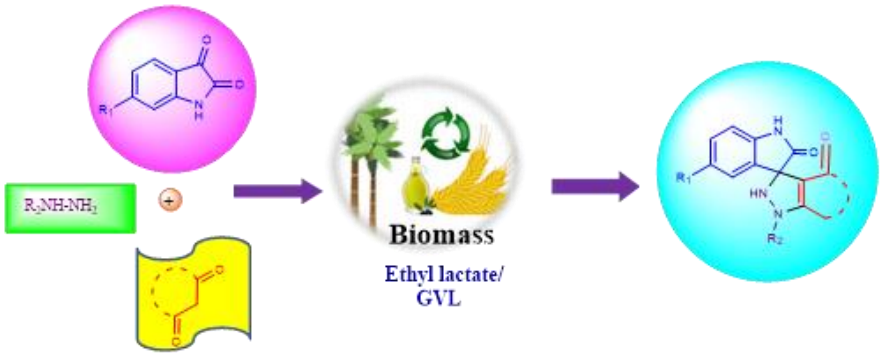
A clean and efficient, versatile, one pot, catalyst free, multicomponent strategy for the synthesis of spirooxindole-indazolones and its derivatives is reported. Synergistic effect of a green solvent system i.e. Ethyl lactate and γ- valero lactone (GVL), enhance the product yield and make this protocol superior than previously reported method by our group. This method includes several benefits like green solvent system, synergistic effect, high atom economy, good to excellent yield etc. making it valuable green alternative to the existing methods.



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Paper-12 | Heterocyclic Letters 13: iss.-2 (2023), 331-344

Synthesis, Structural elucidation and Biological studies on 3d-metal complexes of the heterocyclic ligand 3-{2-[4-(4-chlorophenyl)-1, 3-thiazol-2-yl] hydrazinylidene}-1, 3-dihydro-2H-indol-2-one

Shridhar P Melkeri[1], P. Parameshwara Naik[2]*, Yadav D Bodke[1], Ranjitha. N[2], Vasantakumar Naik N.K[2].

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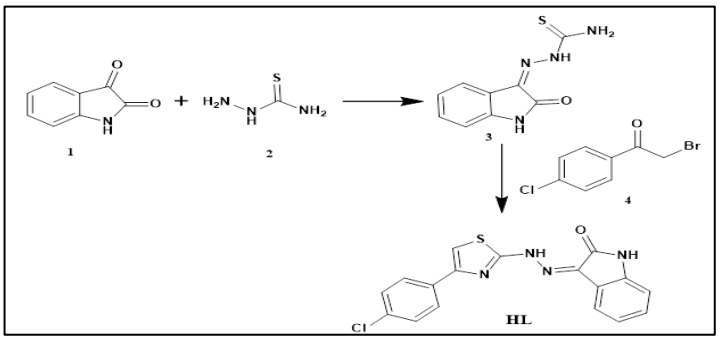
[2]*Department of Chemistry, Sahyadri Science College, Kuvempu University, Shivamogga, Karnataka-577201, India*
*Correspondence: Email-parashchem@gmail.com

The present work elaborates the synthetic, structural and biological properties of the 3d-metal complexes of the ligand 3-{2-[4-(4-chlorophenyl)-1,3-thiazol-2-yl]hydrazinylidene}-1,3-dihydro-2H-indol-2-one. The various spectrochemical techniques were employed to propose the structure of the ligand and its metal chelates. All the newly synthesized compounds were screened for antimicrobial and antitubercular activities. The investigations studies revealed the appreciable effi
cacy against the tested microbes.



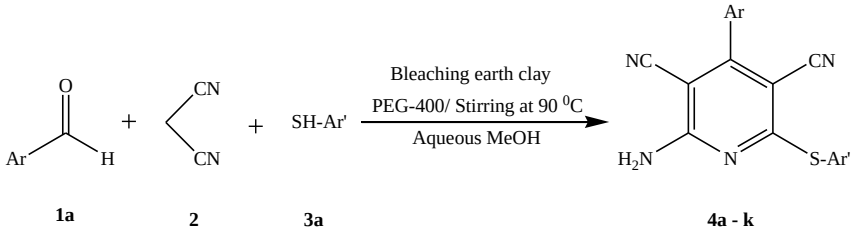
Paper-13 | Heterocyclic Letters 13: iss.-2 (2023), 345-351

Synergetic catalytic bleaching earth clay and peg-400 for rapid synthesis of highly efficient synthesis of substituted pyridines

Abhijit V. Bachute[a*], Kishore Puri[b] and Santosh B. Gaikwad[c]

[a] *Department of Chemistry, Sambhajirao Kendre College, Jalkot, Dist- Latur-413532 Maharashtra, India.*
[b] *Department of Chemistry, Shri Shivaji College of Arts, Commerce and Science, Akola – 444 003 (Maharashtra), India.*
[c] *Department of Chemistry, Late Pundalikrao Gawali Arts and Science College, Shirpur (Jain), Dist. Washim – 444504, Maharashtra, India.*
Corresponding author E-mail: abhijitbachute327@gmail.com

One pot, three component synthesis of 2-amino-4-aryl-3, 5-dicyano-6-sulfonyl pyridines from the reaction of aromatic aldehydes, malononitrile and thiophenol in presence of effective synergetic catalytic system basic bleaching earth clay and PEG-400 as catalyst at room temperature is described.



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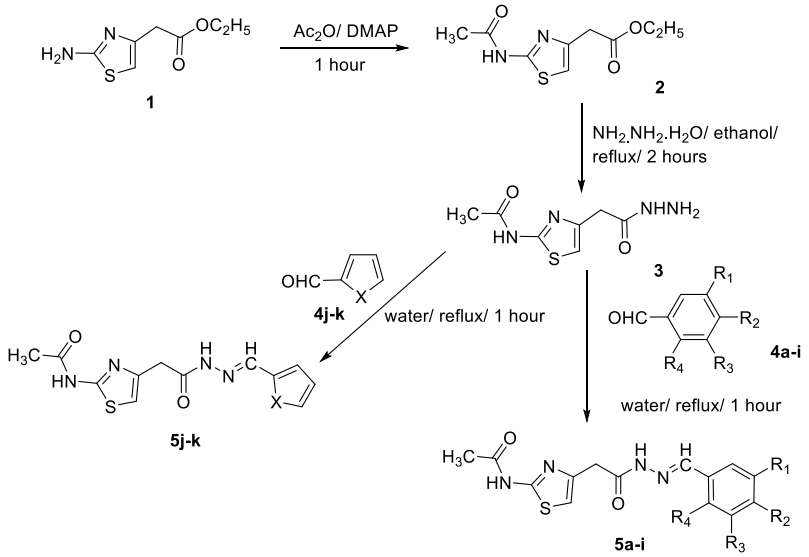
Paper-14	Heterocyclic Letters 13: iss.-2 (2023), 353-361

A green approach for the synthesis of thiazolyl hydrazones

Lata Vodwal[1*], Pinkey Bajaj Gandhi[1] and Archana Gupta[2*]

[1] Department of Chemistry, Maitreyi College, Bapudham Complex, Chanakyapuri, New Delhi- 110021 University of Delhi, New Delhi-110021, India [2] Department of Chemistry, North Campus, University of Delhi, Delhi-110007, India
**Corresponding Author (s). E-mail: latavodwal@gmail.com , gupta_archana18@yahoo.com*

A novel series of thiazolyl hydrazones (**5a-k)** was synthesized using a green chemistry approach. This was achieved by subjecting 2-(2-acetamido-thiazol-4-yl)acetohydrazide **3** to nucleophilic addition reactions with substituted aromatic/heterocyclic aldehydes (**4a-k**). The hydrazones (**5a-k**) were obtained in high yield without the need for further purification and could serve as important precursors for synthesizing bioactive natural products and drug molecules. The structures of the products were determined using analytical, spectral, and single-crystal X-ray diffraction analyses.



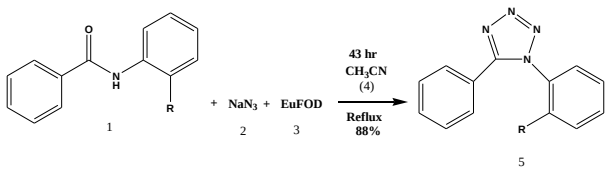
Paper-15	Heterocyclic Letters 13: iss.-2 (2023), 363-366

A one pot method for the Synthesis of 1, 5-Disubstituted Tetrazole catalyzed by EuFOD

G. Nageswara Rao*

Department of Chemistry, Telangana University, Nizamabad, Telangana State-503322, India

1-(2-trifluoromethan phenyl)-5-phenyl-1H-tetrazole from amide a mixture of 2-Trifluoromethyl aniline, sodium azide and EuFOD in dry acetonitrile with Reflux 43hr.



scheme 1

Heterocyclic Letters
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Paper-16	Heterocyclic Letters 13: iss.-2 (2023), 367-374

Synthesis and studies of molecular docking of new indole derivatives as Antimicrobial activity

Amira A. Ghoneim*[a, b] and Menna M. Abdelgany[c] and Yosuf Mohamed[d]

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cChemistry Department Faculty of pharmacy, Egyptian Russian University, Egypt.
dFaculty of Science, B.Sc., Hons. Biology – Keele York University Canada
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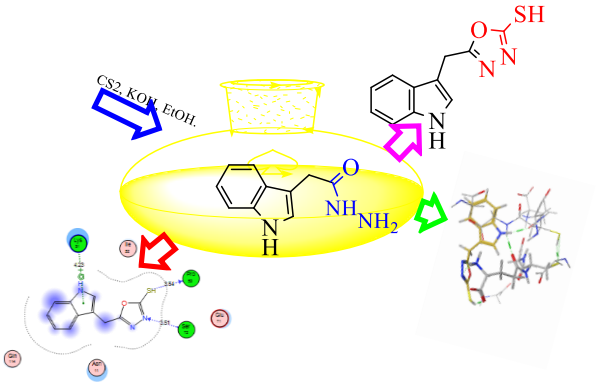
The present work is mainly dedicated to heterocyclic compounds as well as 5-((1H-indol-3-yl) methyl)-1, 3, 4-oxadiazole-2-thiol (2) which was obtained from the reaction 1 with potassium hydroxide and excess carbon disulfide in ethanol. A series of heterocyclic compounds synthesized from 2-(1H-indol-3-yl) acetohydrazide (1) with succinic anhydride, phthalic anhydride and acetyl acetone. These newly synthesized compounds were docked within the active site of oxidoreductase (5HFK). The results of this docking study revealed that the new compounds might exhibit good anti-inflammatory activity**.**



Paper-17	Heterocyclic Letters 13: iss.-2 (2023), 375-390

Synthesis of *difluoromethoxybenzimidazole* clubbed chalcone derivatives: a strategic approach for deriving improved class of *in-vitro* antimicrobial agents

R. Kshatriya[a], J. Vora[b], V. Khedkar[c], P. Jha[d], and D. Joshi[e*]

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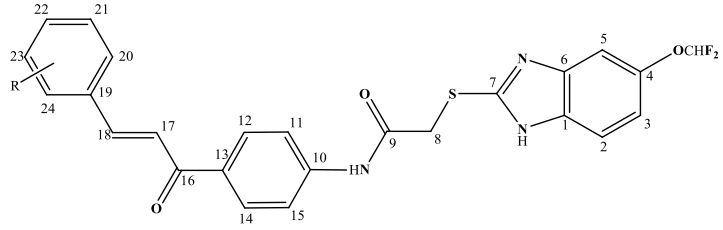
[b] *Vice-Chancellor, Hemchandracharya North Gujarat University, Patan-384265, Gujarat, India*
[c] *School of Pharmacy, Vishwakarma University, Pune-411048, Maharashtra, India*
[d] *School of Applied Material Sciences, Central University of Gujarat, Sector-30, Gandhinagar, India*
[e] Chemistry Research Laboratory, Chemistry department, Sheth M. N. Science College, Patan-384265, Gujarat, India

Synthesis of fluorine substituted benzimidazole clubbed chalcone molecules via acid catalyzed aldol condensation using thionyl chloride/ethanol system and screened for their anti-bacterial and anti-fungal activity.



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Paper-18 | Heterocyclic Letters 13: iss.-2 (2023), 391-395

Synthesis and spectral characterization of pyrazole based 2-azetidinones

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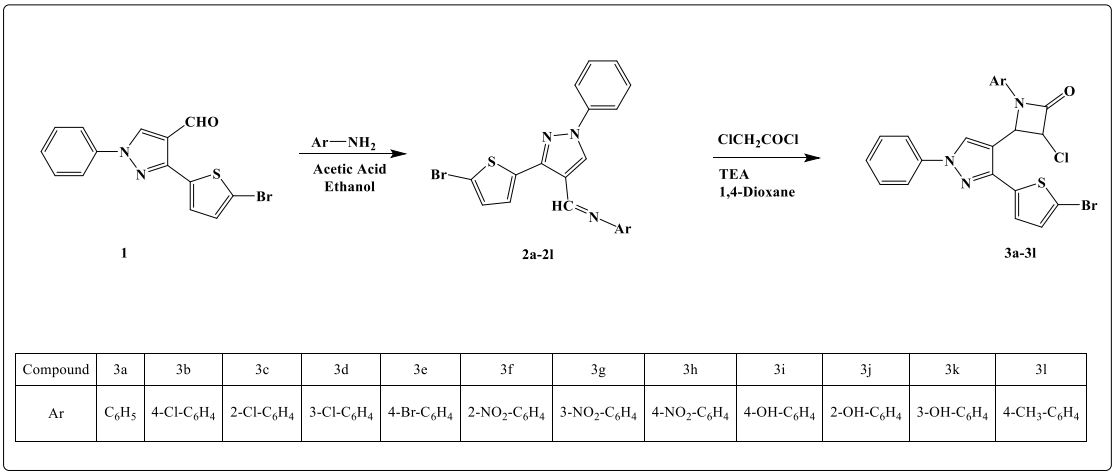
[b]*Rajarshee Shahu Science College, Chandur Rly., 444704, Maharashtra*
smanohare@gmail.com

Synthesis and spectral characterization of 2-azetidinone containing pyrazole scaffold, i.e. 4-(3-(5-bromothiophen-2-yl)-1-phenyl-1H-pyrazol-4-yl)-3-chloro-1-(aryl) azetidin-2-one from reaction of 1-(3-(5-bromothiophen-2-yl)-1-phenyl-1H-pyrazol-4-yl)-N-(aryl) methamine with chloroacetyl chloride in 1,4-dioxane as a solvent in presence of triethylamine.



1 2a-2l 3a-3l

Compound	3a	3b	3c	3d	3e	3f	3g	3h	3i	3j	3k	3l
Ar	C_6H_5	4-Cl-C_6H_4	2-Cl-C_6H_4	3-Cl-C_6H_4	4-Br-C_6H_4	2-NO_2-C_6H_4	3-NO_2-C_6H_4	4-NO_2-C_6H_4	4-OH-C_6H_4	2-OH-C_6H_4	3-OH-C_6H_4	4-CH_3-C_6H_4

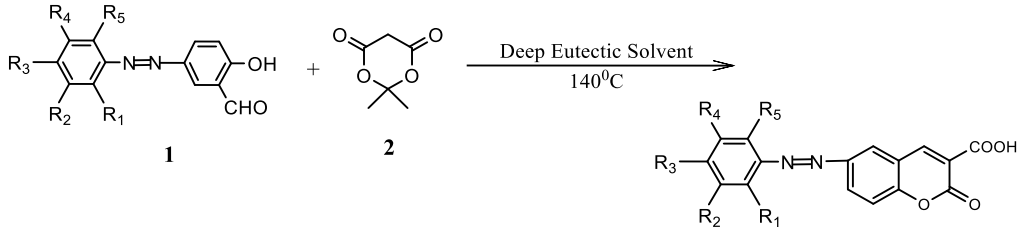
Paper-19 | Heterocyclic Letters 13: iss.-2 (2023), 397-402

Synthesis and characterization of azo derivatives of coumarin-3-carboxylic acid using deep eutectic solvent

Satyabhama Vishwakarma [a*], Ratnamala P. Sonawane [b]

[a*, b] Dr. Homi Bhabha Atomic Research University, Department of Chemistry, The Institute of Science, 15 Madam Cama Road, Mumbai – 400 032, Maharashtra, India
*Corresponding author Email: svsatyabhama@gmail.com

The Knoevenagel condensation of Meldrum's acid and azo derivatives of coumarin-3- carboxylic acid takes place rapidly using deep eutectic solvents (DES) which as compared to conventional method of reacting these using ethanol or methanol as solvents. The reactions are carried out at temperature of 140°C for 45 minutes to 2 hours. Most reaction took place within an hour. The best part of the use of DES can be regenerated and reused.



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PRESPECTIVE

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My Silver Jubilee With Bismuth Salts

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We have investigated bismuth salts-mediated reactions for the preparation of numerous organic molecules of medicinal importance starting from 1998. The reactions conducted with bismuth salts are fast and environmentally friendly. Bismuth salts are able to release acids during the reactions. These salts are able to serve as Lewis acids in these reactions as well. An expeditious synthesis of versatile organic compounds in racemic and optically active forms is performed in our research laboratory.

REVIEW

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Synthetic progress of diverse heterocyclic scaffolds by mcr strategies: a review

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A general view of our study aimed towards the recent and efficient synthesis of structurally diverse heterocyclic skeletons by combinatorial methodologies is presented. Multi-component Reactions (MCRs) assumes a critical part in procuring a greener approach in synthetic chemistry of the fact that these responses are eco-friendly, inexpensive, and systematically synthesis in the facets of reaction time, number of steps, yield, work-up procedure, atom-economy and mild conditions. When combined with the one-pot procedure, MCRs provide an efficient synthetic methodology for a variety of highly complex molecules. These responses are broadly utilized by synthetic chemists to make heterocyclic motifs with altogether extended varieties having different advantages to the society. The current review surveys recent developments and advances of MCRs in the entire synthesis of N, S, and O bearing diverse heterocyclic scaffolds.