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Graphical Abstract

Heterocyclic Letters 8: iss.-2 (2018), 267-272

Catalyst-free one-pot four-component synthesis of some new 2,4,6-triaryl pyridine derivatives

Mahmoud Abdi[a*], Hossein Behmadi[a] and Ali Es-haghi[b]

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[b] Department of Biology, Mashhad Branch, Islamic Azad university. Mashhad, Iran.
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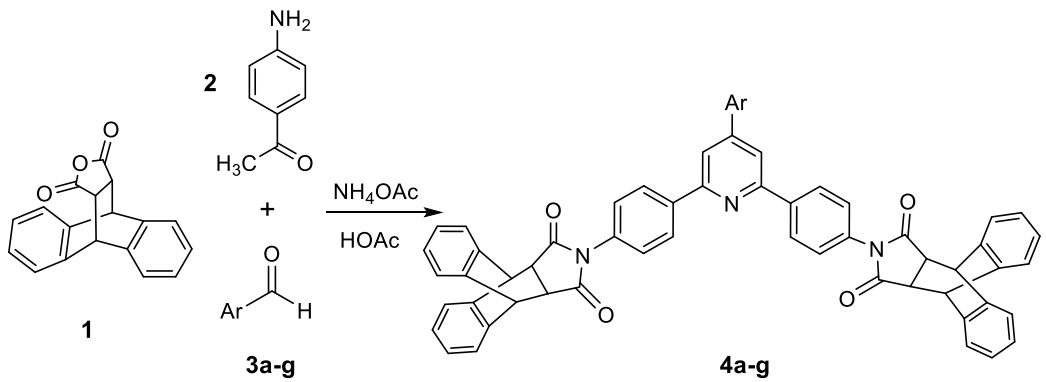
In the present work, a new series of 2,4,6-triaryl pyridines derivatives *via* one-pot four-component condensation reaction of dibenzobarallene, 4-amino acetophenone, various aromatic aldehydes and ammonium acetate in acetic acid as solvent were synthesized. The structures of synthesized products were confirmed by FT-IR, ^{1}H-NMR, ^{13}C-NMR spectra and analytical data.



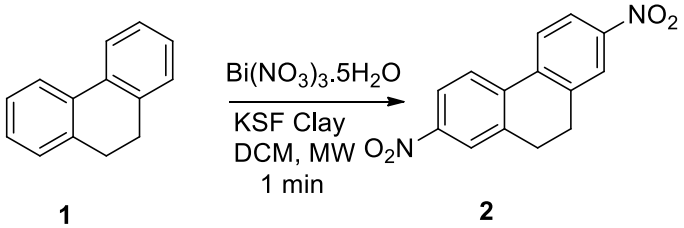
Heterocyclic Letters 8: iss.-2 (2018), 273-276

Microwave-induced bismuth nitrate-impregnated clay-mediated novel dinitration of 9,10- dihydrophenanthrene: a precursor for new heterocycles

Ram N. Yadav,[1, 2] Leonardo Salazar,[1]Amrendra Kumar Singh[2] and Bimal Krishna Banik[1, 3*]

[1]Department of Chemistry, The University of Texas-Pan American, 1201 West University Drive, Edinburg, TX 78539, USA; [2]Department of Chemistry, Faculty of Engineering & Technology, Veer Bahadur Singh Purvanchal University, Jaunpur-222003, U.P., India; [3]Current Address: Vice President, Community Health Systems of South Texas, Edinburg, Texas 78539; Email: bimalbanik10@gmail.com; bimal.banik@chsst.org; nareshutpa@gmail.com

A facile method for the dinitration of 9, 10-dihydrophenanthrene using domestic microwave-induced bismuth nitrate-impregnated clay is developed



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Heterocyclic Letters 8: iss.-2 (2018), 277-285

Nano silica boron sulfuric acid as a dual brønsted/lewis solid acid for the synthesis of 5-substituted-1*h*-tetrazoles

Motahareh Yazdanian[a], Mohammad Javaherian[a]*and Hosein Hamadi[a]

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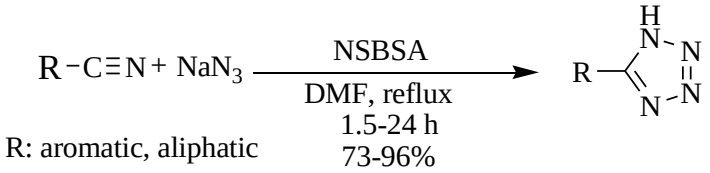
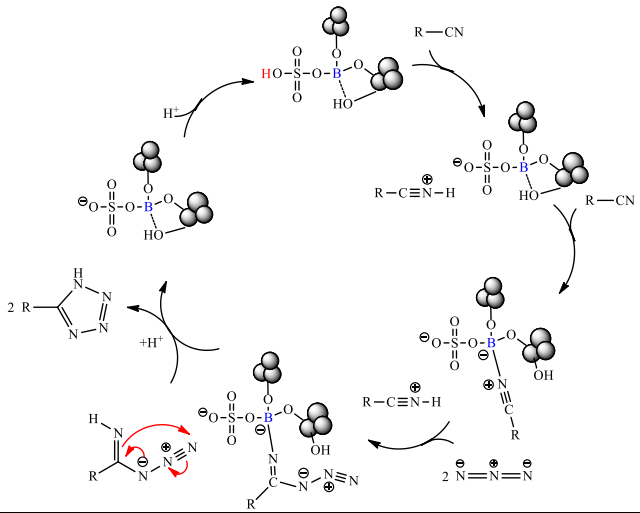
**e-mail:m.javaherian@scu.ac.ir , phone: +98 611 33331042, fax: +98 611 33331042*

Synthesis of 5-substituted-1*H*-tetrazoles from nitriles and sodium azides catalyzed by nano silica boron sulfuric acid (NSBSA)





Heterocyclic Letters 8: iss.-2 (2018), 287-295

Stereoselectivity of Phthalimido β-Lactams Formation: Synthesis of 3-Amino Beta-Lactams Through a Facile Deprotection Reaction

Armando Paniagua1, Ram Naresh Yadav,1, 2 Sunena Chandra1 and Bimal Krishna Banik1, 3 *^

1Department of Chemistry, The University of Texas-Pan American, 1201 West University Drive, Edinburg, TX 78539, USA; 2Department of Chemistry, Faculty of Engineering & Technology, Veer Bahadur Singh Purvanchal University, Jaunpur-222003, U.P., India; 3Current Address: Vice President, Community Health Systems of South Texas, Edinburg, Texas 78539; Email: bimalbanik10@gmail.com; bimal.banik@chsst.org

Synthesis of amino beta-lactams is a crucial objective because of the medicinal properties associated with them and the products derived from of them. Stereocontrolled synthesis of phthalimido beta-lactams is performed and cis and trans-phthalimido beta-lactams are deprotected with ethylene diamine (and other reagents) to amino beta-lactams of diverse structures in excellent yield. This reaction is also conducted under solventless conditions to afford identical products.

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Heterocyclic Letters 8: iss.-2 (2018), 297-302

Synthesis and anti-inflammatory activity of novel pyrazoline derivatives

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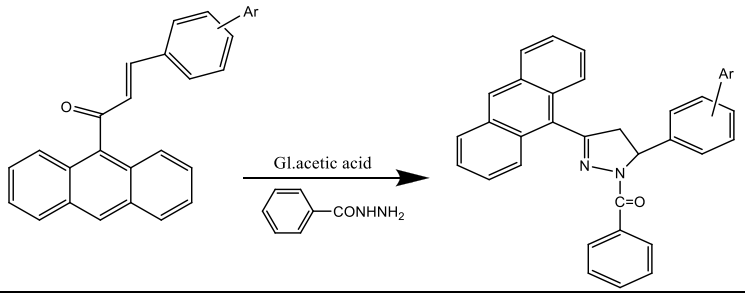
Email: revan@nitte.edu.in

A novel series of Pyrazolines were synthesized by reacting 9-anthraldehyde Chalcones and benzhydrazide in glacial acetic acid medium. All the new compounds were characterized by spectral data and all the compounds were evaluated for *In-Vitro* anti-inflammatory activity.



Heterocyclic Letters 8: iss.-2 (2018), 303-311

Simple and Efficient Synthesis of Novel Chromone/Benzimidazole/Benzothiazole Hybrid Heterocycles

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[b]*Department of Chemistry, Osmania University, Hyderabad-500001, India*
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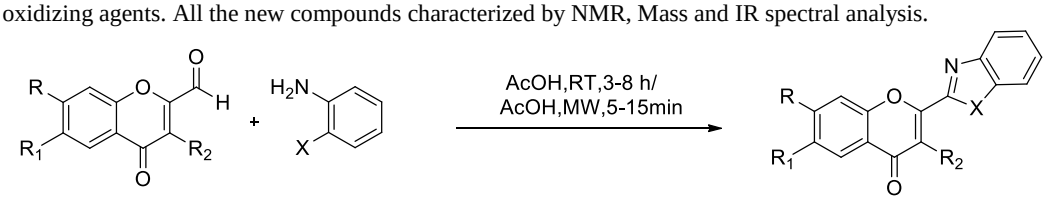
(Tel.: +91-9849814236: E-mail id: yjpr_19@yahoo.com

A new series of chromone linked benzimidazole/benzothiazole hybrid heterocycles synthesized by conventional and microwave assisted methods from chromone-2-carbaldehydes by coupling with *o*-phenylenediamine/2-aminothiophenol without using any oxidizing agents. All the new compounds characterized by NMR, Mass and IR spectral analysis.



a) $R=R_1=R_2=H$
b) $R=OMe$, $R_1=H$, $R_2=CH_3$
c) $R=Me$, $R_1=Cl$, $R_2=H$

a) $R = R_1 = H$
b) $R = Me$, $R_1 = Cl$

$X= NH_2, SH$

.

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Heterocyclic Letters 8: iss.-2 (2018), 313-318

Synthesis, Characterization and screening of Antifungal activity of triazepino benzothiazole and its 3-substituted derivatives

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S.R.T.M.U, Nanded. Maharashtra, India.
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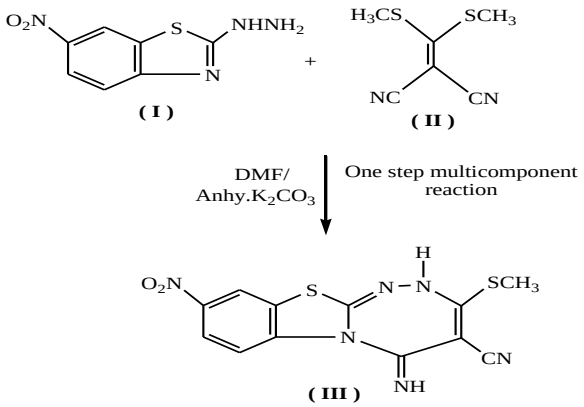
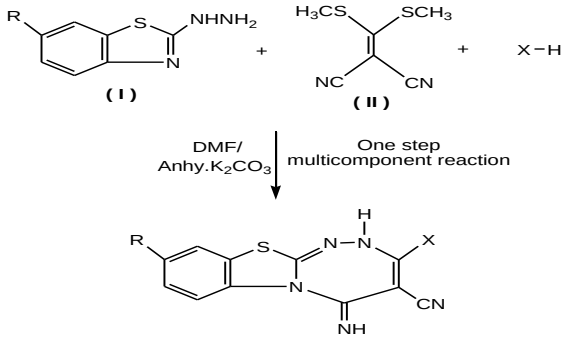
A simple and efficient method have been used for the synthesis of 3-Substituted derivatives of 4-Cyano-5-imino-3-methylthio-9-nitro-2H-1,2,4-triazepino [3,4-*b*] [1,3] benzothiazole (III) have been prepared through one step multicomponent reaction by heating a mixture of 2-hydrazino-6-nitro benzothiazole (I) and bis methylthio methylene malononitrile (II) independently with aromatic amines / phenols / heterylamines / compounds containing active methylene group respectively in the presence of dimethyl formamide and catalytic amount of anhydrous potassium carbonate. All these newly synthesized compounds were screened for antifungal activity. **Scheme-I :**



Scheme-II :



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Heterocyclic Letters 8: iss.-2 (2018), 319-324

One pot, step-wise and tandem synthesis of novel dihydrophthalazine-1, 4-diones

Vijaya Bhasker G[1], Laxminarayana E[2], Venkatarami Reddy V [1] and Thirumala Chary M[1]*

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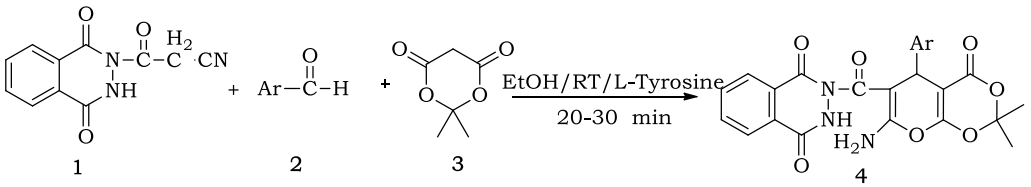
[2]Sreenidhi Institute of Science and Technology, Yamnampet, Ghatkesar, Hyderabad-500 301, (Telangana) India.
Mail ID: gvbhasker.chem@gmail.com

One pot, three-component synthesis of novel 2-(7-amino-2,2-dimethyl-4-oxo-5-phenyl-4,5-dihydropyrano[2,3-*d*][1,3]dioxine-6-carbonyl)-2,3-dihydrophthalazine-1,4-diones prepared condensing 3-(1,4-dioxo-3,4-dihydrophthalazin-(1H)-yl)-3-oxopropanenitrile , benzaldehydes and meldrum's acid using L-Tyrosine as catalyst in EtOH at RT for 20-30 min. The products have been isolated in good yields as clean compounds without using column chromatography.



1 2 3 4

Heterocyclic Letters 8: iss.-2 (2018), 325-331

An alternate and scalable process for the synthesis of temozolomide

Rajesh Kumar Rapolu [a, b], Murthy Chavali[b], Naveen Mulakayala[c,*], V.V.N.K.V. Prasada Raju[a]

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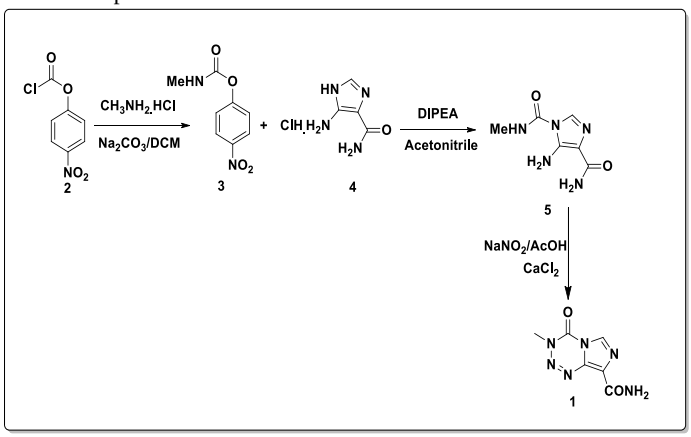
[b]Department of Chemistry, Vignan's Foundation for Science, Technology and Research University (VFSTRU), Vadlamudi, Guntur-522 213, India
[c]Clearsynth Labs Ltd, IDA Mallapur, Nacharam, Hyderabad -500076, India
Email: rapolu.rajesh@gmail.com

An alternate and scalable process for the synthesis of anti-cancer drug temozolomide is described. Synthesis of urea intermediates is disclosed with high yields and purity using an alternate carbamatereagent which would avoid the usage of toxic methyl isocyanate. Optimum and robust process for the conversion of urea intermediate to temozolomide is presented.



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Heterocyclic Letters 8: iss.-2 (2018), 333-338

An efficient and facile synthesis of 2-aryl-{[(3-methelene)-(3′-difluoromethoxy)-5′-(3″-methyl)-4″-(2″,2″,2″-trifluoroethoxy)pyridin-2″-yl]methoxyphenyl}-quinoxalines and its antimicrobial evaluation

Sandip P. Kakadiya, Yashwantsinh Jadeja, Dipak M.Purohit*

**Shree M.& N. Virani Science College, Chemistry Department, Kalawad Road,Rajkot-5,Gujarat,(INDIA).*
Department of Chemistry,Marwadiuniversity,Rajkot.
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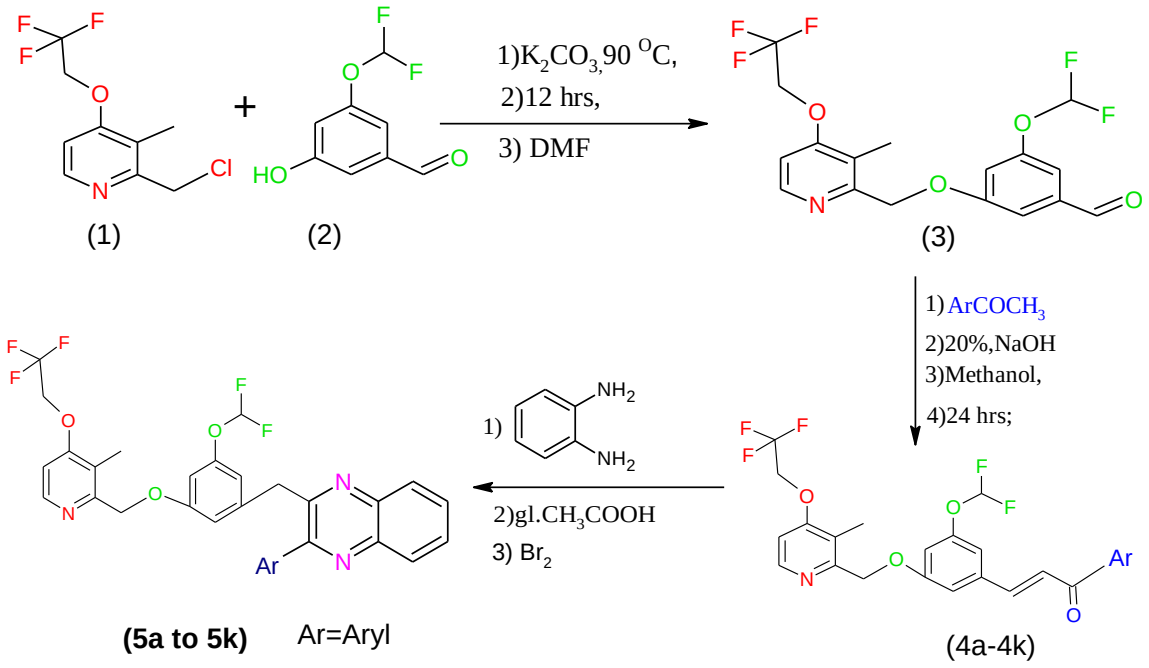
(2) sandip.k.msc@gmail.com

2-Aryl-{[(3-methylene)-(3′-difluoromethoxy)-5′-(3″-methyl)-4″-(2‴,2‴,2‴-trifluoroethoxy) pyridine-2″-yl]methoxyphenyl-quinoxalines(5a-5k) the condensation of (E)-3-{[(3′-difluoromethoxy)-5′-(3″-methyl)-4″-(2‴,2‴,2‴-trifluoroethoxy)pyridin-2″-yl]methoxyphenyl}-1-aryl-prop-2-ene-1-ones (4a-4k)of with hydrazine hydrate in methanol .. The products (5a-5k) were assigned by IR, ^{1}HNMR, Mass spectral data, TLC and element analysis.



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Heterocyclic Letters 8: iss.-2 (2018), 339-344

Microwave assisted Synthesis of Bis-Pyrazoles using Glutarimide

S. S. Rajput [1*], S. N. Patel [2], S. B. Chaudhari [3]

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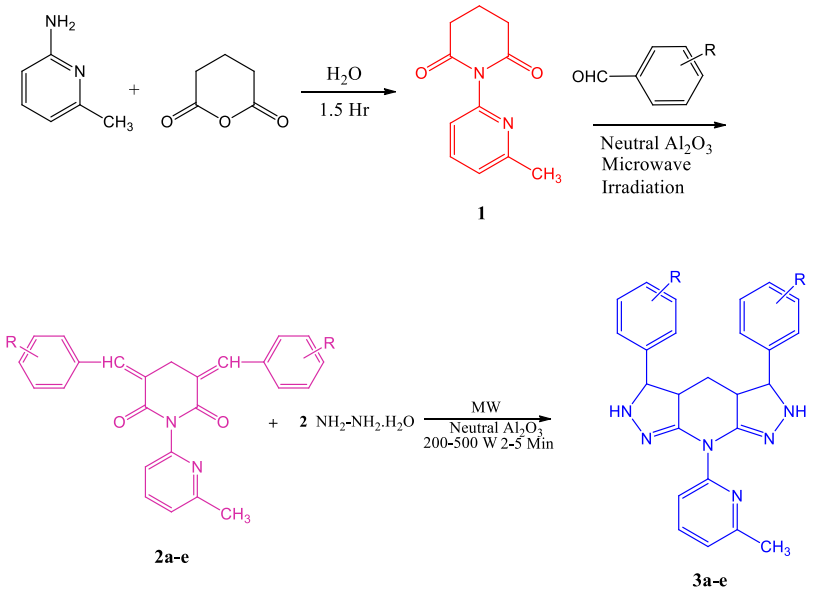
[3] Departments of Chemistry, R.C.Patel ASC College, Shirpur 425405, Maharashtra, India

In the present work The Microwave assisted Solvent free Synthesis of Bis- chalcones (**2a-e)** and Bis- pyrazole (**3a-e)** derivatives have been reported. The Bis- chalcones (**2a-e)** were prepared by condensing 1-(6-methylpyridin-2-yl) piperidine-2,6-dione**(1)** with substituted aldehydes using solid support neutral Al_2O_3 in microwave. bis-chalcone products underwent ring closer with hydrazine hydrate in presence of neutral Al_2O_3 under microwave irradiation offer Bis- pyrazole (**3a-e)** derivatives.



R= a= 4-No_2, b= 4-OH, c= 4-CN, d= 4-Br, e= 2-Br

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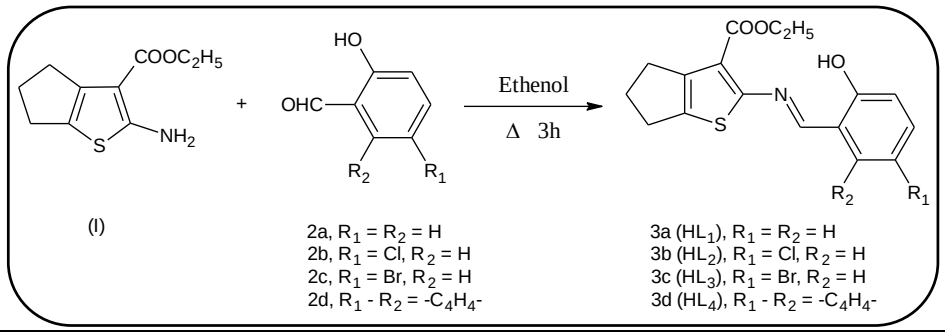
Heterocyclic Letters 8: iss.-2 (2018), 345-357

Copper Complexes of Aminothiophene Schiff bases as Antimicrobial Agents: Synthesis, Structural Characterization, Antimicrobial and Antitubercular Activity Evaluation

Ganesh More[1], Sakina Bootwala[1*] and Sujata Patil[2]

[1]Department of Chemistry, [2]Department of Physics
Wilson College, Mumbai, India-400007.

Series of potentially tridentate Schiff bases (3a-d) were derived from condensation of ethyl 2-amino-5,6-dihydro-4*H*-cyclopenta[*b*]thiophene-3-carboxylate (I) with o-hydroxyl aldehyde derivative (2a-d) which formed Cu(II) complexes in 1:1 molar ratio. All the complexes were characterized through elemental analysis, FTIR, UV-Visible, ESR, XRD, magnetic susceptibility and molar conductance technique. All prepared compounds were assessed for antimicrobial activity against multidrug resistant gram negative ESBL and MBL bacterial strains and for antitubercular activity against *M. tuberculosis* (H37Rv strain).



(I)

2a, $R_1 = R_2 = H$
2b, $R_1 = Cl$, $R_2 = H$
2c, $R_1 = Br$, $R_2 = H$
2d, $R_1 - R_2 = -C_4H_4-$

3a (HL_1), $R_1 = R_2 = H$
3b (HL_2), $R_1 = Cl$, $R_2 = H$
3c (HL_3), $R_1 = Br$, $R_2 = H$
3d (HL_4), $R_1 - R_2 = -C_4H_4-$

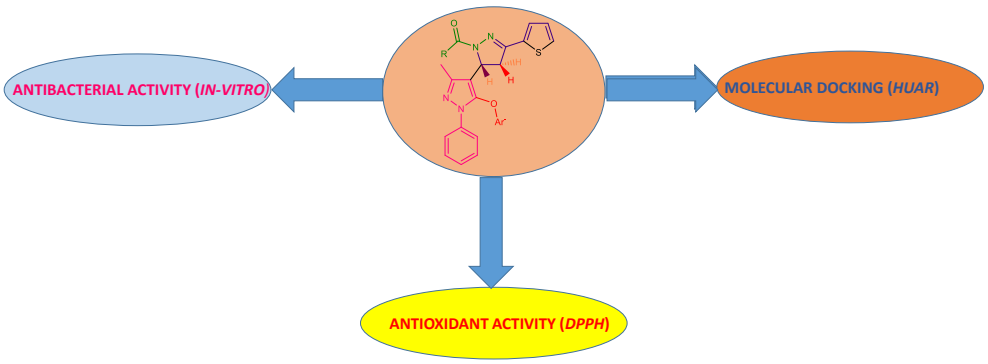
Heterocyclic Letters 8: iss.-2 (2018), 359-366

Spectroscopic, computional and biological evaluation of novel pyrazole carrying pyrazoline derivatives

Manju N, Balakrishna Kalluraya[*], Asma

Department of Studies in Chemistry, Mangalore University, Mangalagangothri-574199, Karnataka, India
Email: bkalluraya@gmail.com
Contact No.: 9448824075.

A new series of pyrazoline carrying pyrazole derivatives were synthesized and characterized by FT-IR, ^{1}H-NMR, ^{13}C-NMR and analytical data. All the synthesized compounds were screened for *in-silico* molecular docking analysis with *Hu*AR receptor. In addition, the *In-vitro* antioxidant and antibacterial activities were also performed. Compounds **4a**, **4e,** and **4f** exhibited significant antibacterial activity. Compounds **4e** and **4b** showed moderate radical scavenging activity.



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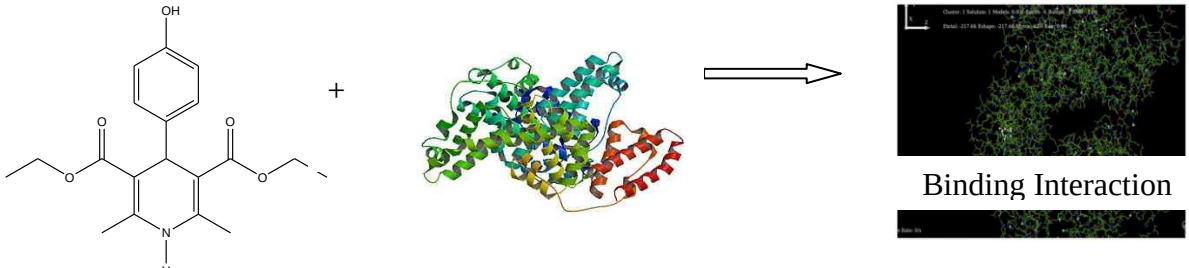
Heterocyclic Letters 8: iss.-2 (2018), 367-373

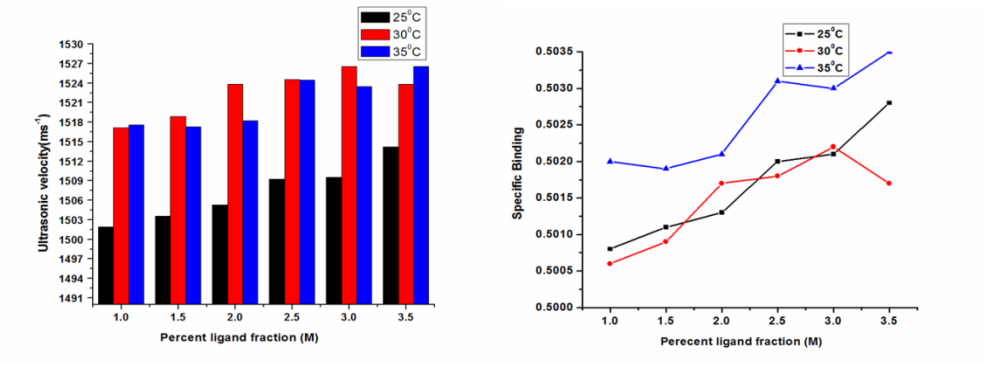
***In vitro* binding study of 4HDDD to BSA at physiological pH: acoustical and thermodynamic study**

Ajay M. Pisudde [a], Pradip V. Tekade[*a], Shrikant B. Thakare[a] , Pravin S. Bodkhe[b] , Sandip S. Petare[c]



Diethyl 4-(4-hydroxyphenyl)-2, 6-dimethyl-1, 4-dihydropyridine-3, 5-dicarboxylate

BSA



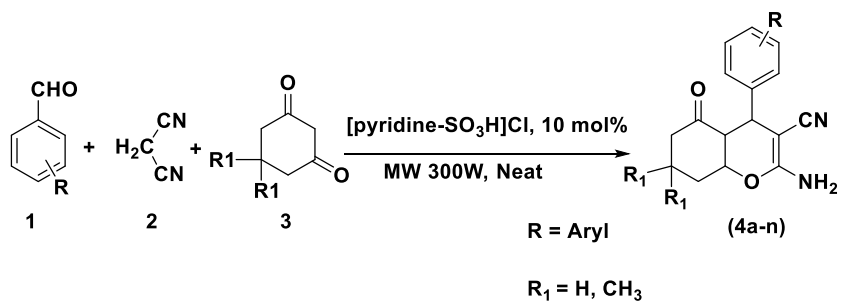
Scatchard plot

Heterocyclic Letters 8: iss.-2 (2018), 375-384

Green, expeditious and recyclable specific acidic ionic liquid [pyridine–so$_3$h]cl catalyzed one pot synthesis of 2-amino-4-phenyl 4h-chromene-3-carbonitrile scaffolds under microwave irradiation

B. Sonyanaik, B. Sakram* D. Ravi, A. Kurumanna, and P. Madhu

Green and medicinal chemistry laboratory, department of chemistry, osmania university, tarnaka-500007, telangana state, india
**email: bschemou@gmail.com*



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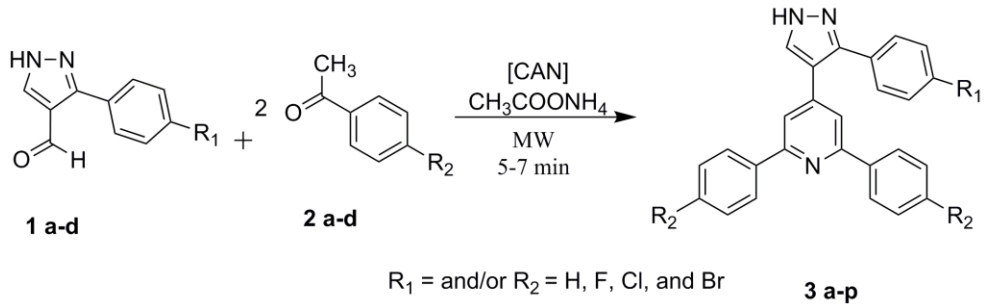
Heterocyclic Letters 8: iss.-2 (2018), 385-393

Microwave assisted synthesis of halo-aryl-substituted-1h-pyrazol-pyridne moiety and study on "effect of halogen substitution on antimicrobial activity"

Nileshkumar D. Vala and Manish P. Patel*

Department of Chemistry, Sardar Patel University, Vallabh Vidyanagar-388120, Gujarat, India
E-mail: nileshdv89@gmail.com

16 Derivatives of halo-aryl-substituted-1H-pyrazol-pyridine moiety **3a-p** were synthesized by microwave irradiated one pot cyclocondensation of 3-substituted-1H-pyrazole-4-carbaldehyde **1a-d** and 4-substituted-acetophenone **2a-d** in presence of ceric ammonium nitrate (CAN). Various halogen substitutions were made for the study of effect on antimicrobial activity by halogen substitution on aryl-1H-pyrazol-pyridine moiety. The newly synthesized compounds were characterized by ^{1}H NMR, ^{13}C NMR and FT-IR spectral data, the molecular weight of compounds are confirmed by mass spectrometry. All compounds are screened for their antimicrobial activity against S.aureus; B.subtilis; C.tetani; E.coli; S.typhi; P.aeruginosa; C.albicans; T.rubrum.



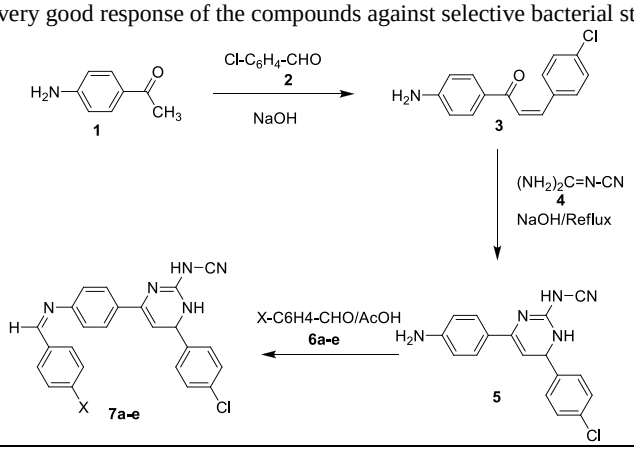
Heterocyclic Letters 8: iss.-2 (2018), 395-400

An expeditious synthesis and microbial studies of novel *n*-(6-(4-chlorophenyl) (substituted-benzylideneamino)phenyl)-1,6-dihydropyrimidin-2-yl)cyanamide

K. Babu

PG and Research Department of Chemistry, Rajah Serfoji Government College (Auto), Thanjavur, Tamil Nadu, India.
Email: kbabu.chemistry@gmail.com

A series of novel schiff bases incorporated with cyanopyrimidine heterocycles have been synthesized by applying simple methods. The structures were confirmed with the help of Melting point, TLC, FT-IR, ^{1}H-NMR and^{13}C-NMR spectra based on the agreement of observed signals with expected signals. The invitro antibacterial activities were examined by using disc diffusion method and observed very good response of the compounds against selective bacterial strains.



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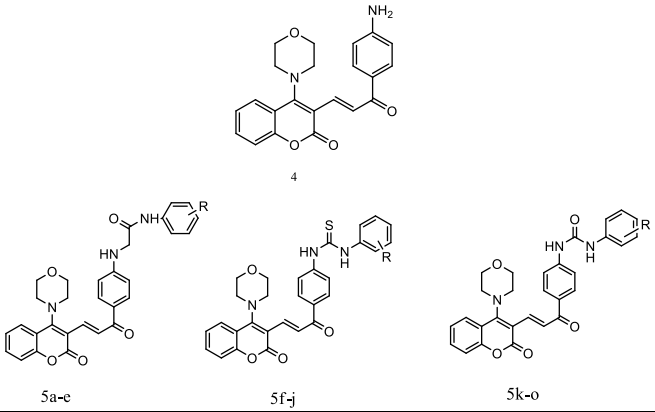
Heterocyclic Letters 8: iss.-2 (2018), 401-410

Synthesis of novel coumarin–chalcone hybrids and screened in vitro antimicrobial and antimycobacterial activities as biologically active pharmacophores

Hemanshu T. Tandel, Kishor H. Chikhalia and Saurabh K. Patel

Department of Chemistry,
Veer Narmad South Gujarat University, Surat, Gujarat, India
E- mail: hemanshutandel44@gmail.com

Based on the pragmatic biological activities of coumarin and chalcones, we have synthesized coumarin–chalcone hybrids with the aim of evaluating their antimicrobial properties. The target compounds were characterized by FT-IR, ^{1}H-NMR, mass spectroscopy as well as elemental microanalysis. Preliminary examination of target compounds as pharmacological active antimicrobial, and antitubercular agents have been carried out by using standard method. Some of the compounds serving as a lead potent for future study.



Heterocyclic Letters 8: iss.-2 (2018), 411-418

A green solvent-free protocol for knoevenagel condensation using heterogeneous reusable 5% of mgo/la$_2$o$_3$ catalyt

G. Balraj and B. Satyanarayana*

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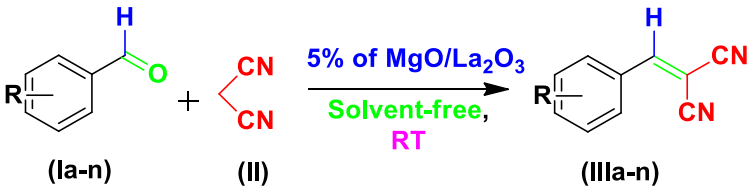
When newly prepared 5% of MgO/La_2O_3 heterogeneous catalyst was used for the Knoevenagel condensation reactions, the catalyst accelerate the reactions time with high percentage of yield under solvent-free conditions. The condensation reactions were optimized using various reaction conditions. The catalyst was characterized by various techniques, including X-ray powder diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR), Scanning electron microscopy (SEM), *Brunauer-Emmett-Teller* (*BET*) *Surface* Area, *Energy Dispersive X*-ray Spectrometry (*EDS*) and UV-Visible DRS, and the Knoevenagel condensation derivatives evaluated using IR, ^{1}H NMR and mass spectroscopy.
Keywords: Knoevenagel condensation, 5% of MgO/La_2O_3, heterogeneous catalyst, solvent-free.

Scheme-1: Synthesis of Knoevenagel condensation reactions (IIIa-p)



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Transition metal polychelates with salen-type schiff base:
Synthetic, spectroscopic, thermal, electrical conductivity, biological, and coordination aspects

Jankiram B. Devhade, Gaurav B. Pethe, Amit R. Yaul, Aatish K. Maldhure, Anand S. Aswar*

Department of Chemistry,
Sant Gadge Baba Amravati University, Amravati-444 602
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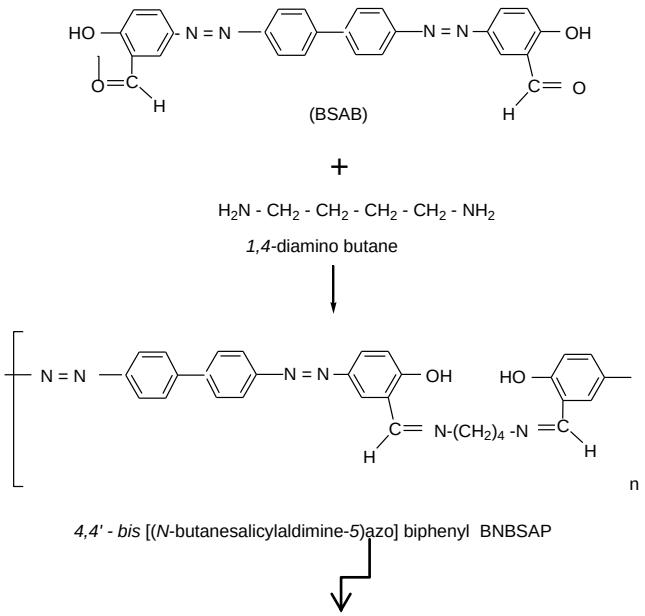
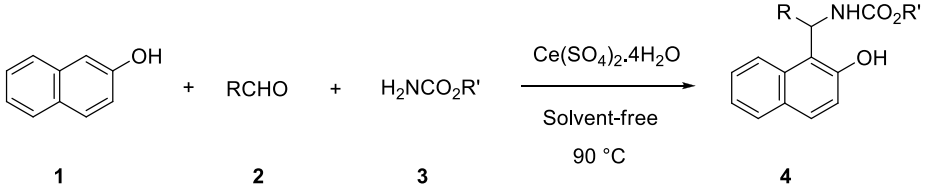


Heterocyclic Letters 8: iss.-2 (2018), 435-441

A rapid and green method for solvent-free click synthesis of carbamatoalkyl naphthols using "$Ce(SO_4)_2.4H_2O$"as novel and reusable inorganic catalyst

Zahra Mehri[1], Abolghasem Davoodnia[1,*], Niloofar Tavakoli-Hoseini[2], Mozhgan Faramarzi[1]

[1] Department of Chemistry, Mashhad Branch, Islamic Azad University, Mashhad, Iran
[2] Young Researchers and Elite Club, Mashhad Branch, Islamic Azad University, Mashhad, Iran



In the absence of any solvent, the reaction of *β*-naphthol with aromatic aldehydes and methyl or benzyl carbamate catalyzed by cerium (IV) sulfate tetrahydrate, $Ce(SO_4)_2.4H_2O$, as an effective and novel inorganic solid acid catalyst under thermal heating conditions smoothly afforded carbamatoalkyl naphthols in high yields. The catalyst is inexpensive and readily available and can be recovered conveniently and reused efficiently such that a considerable catalytic activity still could be achieved after fifth run. Other advantages of this protocol are short reaction times, easy work-up and absence of any volatile and hazardous organic solvents

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Synthesis of (*E*)-2,2-dimethylchroman-4-one-O-((1-benzyl-1H-1,2,3-triazol-4-yl)methyl)oxi mes and (*E*)-2,2-dimethylchroman-4-one-O-((1-phenyl-1H-1,2,3-triazol-4-yl)methyl)oximes

P. Nagendra Reddy, K. Santosh Kumar, V. Rekha and G. L. David Krupadanam

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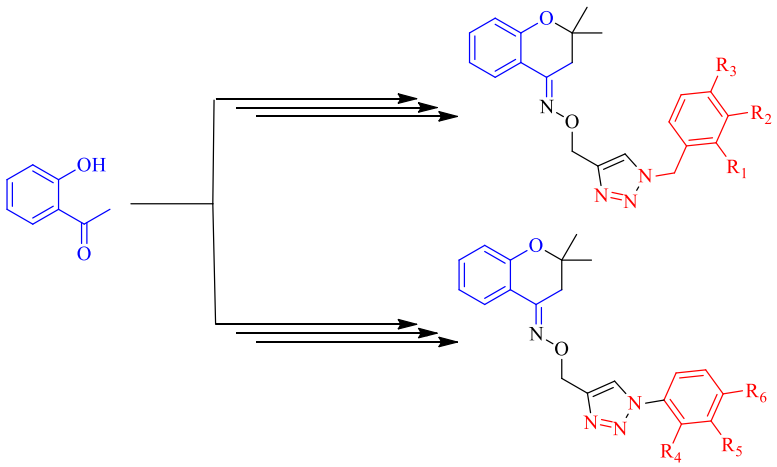
A new series of (*E*)-2,2-dimethylchroman-4-one-O-((1-benzyl-1H-1,2,3-triazol-4-yl)methyl)oxi mes and (*E*)-2,2-dimethylchroman-4-one-O-((1-phenyl-1H-1,2,3-triazol-4-yl)methyl)oximes were synthesized by the reaction of (*E*)-2,2-dimethylchroman-4-one-O-prop-2-yn-1-yloxime and substituted benzyl/phenyl azides



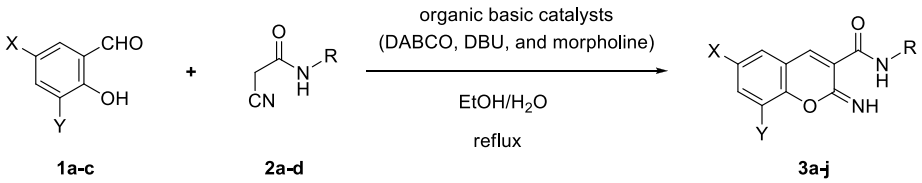
Heterocyclic Letters 8: iss.-2 (2018), 449-454

Nitrogen-containing organic base-catalyzed synthesis of functionalized 2-imino-2*H*-chromenes: a comparative experimental study

Mehri Fattahi[1], Abolghasem Davoodnia[*,1], and Niloofar Tavakoli-Hoseini[2]

[1] Department of Chemistry, Mashhad Branch, Islamic Azad University, Mashhad 9175687119, Iran
[2] Young Researchers and Elite Club, Mashhad Branch, Islamic Azad University, Mashhad, Iran

Catalytic performance of three nitrogen-containing organic basic catalysts including 1,4-diazabicyclo[2.2.2]octane (DABCO), 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU), and morpholine has been investigated in the synthesis of *N*-alkyl-2-imino-2*H*-chromene-3-carboxamides by reaction of salicylaldehydes with *N*-alkyl-2-cyanoacetamides. Among various tested reaction conditions, the results showed that DABCO was the more efficient basic catalyst than DBU and morpholine. The reactions completed within shorter reaction times in a mixture of ethanol and water as solvent with higher yields.



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Heterocyclic Letters 8: iss.-2 (2018), 455-467

Eco-friendly and highly efficient one-pot synthesis of symmetrical and unsymmetrical 1,4-dihydropyridine derivatives using triethylamine as catalyst in ethanol medium

Amar Djemoui [1,2,3]*; Mohamad Redha Ouahrani [1];Abdelkader Naouri [1,4] ; Salah-Eddin Rahmani [2] Lahcen Souli[2, 3] andMokhtar Boualem Lahrech [3].

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2. *Department of Chemistry, Faculty of Exact Sciences and Informatics, ZIANE Achour University. Djelfa, Algeria*
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4. *Health Division, Centre of Scientific and Technical Analyses Physico-Chemical BP 384, Seat former Pasna Industrial Zone Bou-Ismail, Tipaza, Algeria.*

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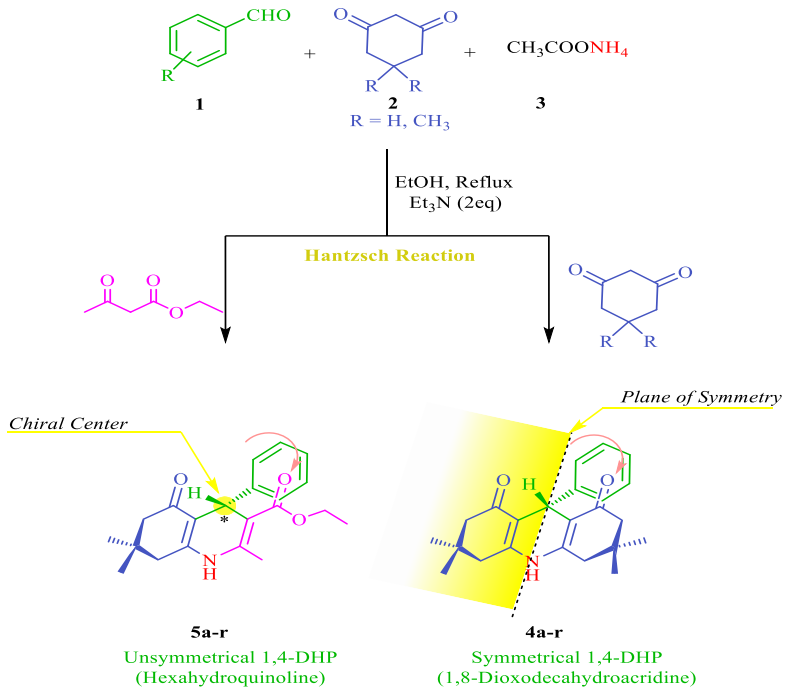
A simple and efficient approach to the synthesis of 1,8-dioxo-decahydroacridines and hexahydroquinolines *via* one-pot multi-component condensation of an aromatic aldehyde, 1,3-diketones and ammonium acetate in ethanol with use of Triethylamine (TEA) as an efficient catalyst is described**.** The present method has several benefits such as excellent yields, relatively short reaction time (90-120 min), simple and easy work-up, green process, and use of a cheap solvent. All the synthesized 1,8-dioxodecahydro-acridines and hexahydroquinolines were characterized on the basis of their melting-points, elemental analysis and spectral data.



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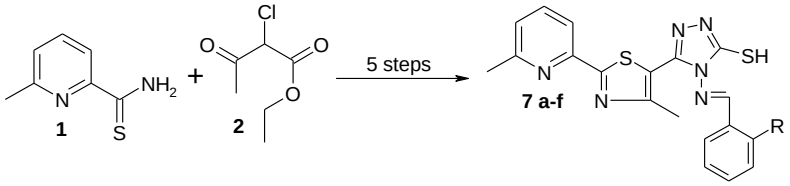
Heterocyclic Letters 8: iss.-2 (2018), 469-475

Synthesis, characterization and antifungal screening of some novel pyridine associated thiazole linked 1,2,4-triazoles

B. Pulla Rao[1*], M. Prasad Reddy[2], B. Sriramudu[1] and D. Ramachandran[1*]

[1]*Department of Chemistry, Acharya Nagajuna University, Nagarjuna Nagar, Guntur-522 510, India*
[2]*Department of Chemistry, GITAM University, Gandhi Nagar, Rushikonda, Visakhapatnam, Andhra Pradesh 53004, India*
[*] *Corresponding author: E-mail: pullarao83@gmail.com*

A synthetic and novel protocol consisting a series of six 4-(benzylideneamino)-5-(4-methyl-2-(6-methylpyridin-2-yl)thiazol-5-yl)4*H*-1,2,4-triazole-3-thiols **(7a-f)** in good isolated yields has been reported. The title compounds were synthesized by using 6-methylpyridine-2-carbothioamide **(1)** as initial compound and through the formation of ethyl-4-methyl-2-(6-methylpyridine-2-yl)thiazole-5-carboxylate **(3)**, 4-methyl-2-(6-methylpyridine-2-yl)thiazole-5-carbohydrazide **(4)**, potassium 2-[4-methyl-2-(6-methylpyridine-2-yl)thiazole-5-carbonyl] hydrazine carbodithioate **(5)** and 4-amino-5-(4-methyl-2-(6-methylpyridine-2-yl)thiazole-5-yl)-4*H*-1,2,4-triazole-3-thiol **(6)** as intermediates on extension of the reaction. Structural formulas of all the synthesized compounds were characterized by IR, ^{1}H-NMR, mass spectral data and elemental analysis. Further, the target compounds were used to evaluate their antifungal activity.



REVIEWS

Heterocyclic Letters 8: iss.-2 (2018), 477-485

Benzoxazine: a biological study of benzoxazine and their derivatives

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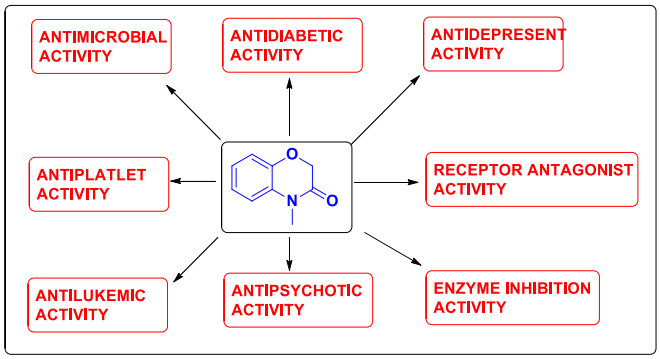
Benzoxazine and its derivatives are frequently utilized as suitable skeletons for the design of biologically active compound due to show their considerable pharmacological actions such as antimicrobial, antimycobacterial, anti-diabetic, antihypolipidaemic, and antidepressant. The versatility of the benzoxazine skeleton, in addition to its relative chemical simplicity and accessibility, makes these chemicals amongst the most promising sources of bioactive compounds. Since the first isolation of 2, 4-dihydroxy-2H-1, 4-benzoxazin-3(4H)-one (DIBOA) and 2, 4-dihydroxy-7-methoxy-(2H)-1,4-benzoxazin-3(4H)-one (DIMBOA), benzoxazine derivatives have attracted the attention of phytochemists. In this review, the biological activities of benzoxazine have been reported upto date. It can act as an important tool for chemists to develop newer benzoxazine derivatives that may prove to be better agents in terms of efficacy and safety.



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Antimicrobial activity and microwave assisted synthesis of 4-chlorophenyl urea derivatives by using dabal-me$_3$

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[b]*Department of chemistry, ICFAI college of Higher education, Hyderabad, Telangana , India.*
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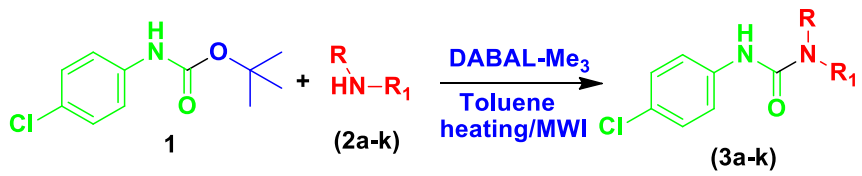
A series of 4-Chlorophenyl urea derivatives have been synthesized from tert-butyl (4-chlorophenyl)carbamate with primary and secondary amines by using DABAL-Me$_3$ under conventional and microwave irradiation. All the synthesized compounds characterized by using spectral data such as IR, ^{1}H NMR, mass spectroscopy and evaluated there in vitro antimicrobial activity.



Heterocyclic Letters 8: iss.-2 (2018), 493-506

Developments in thiazolidinones synthesis: a review

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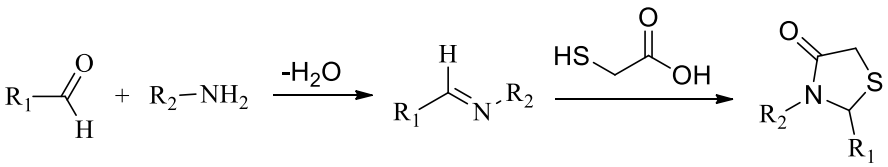
E-mail:manojorg@rediffmail.com



Heterocyclic Letters 8: iss.-2 (2018), 507-525

Recent developments in the synthesis of heterocycles by the application of palladium-catalyzed intramolecular heck reaction

Sanjay Nath

Department of Chemistry, Krishnath College, Berhampore, Murshidabad, W.B., India
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Palladium-mediated cyclization reaction has been recognized as one of the simplest and useful tool for the regio- as well as stereoselective synthesis of carbo- and heterocyclic compounds. In the multi-step synthesis of natural products Heck reaction is frequently used as one of the most important steps. In this review article, I have summarized recent developments in the construction of heterocyclic rings in various ways under palladium-catalyzed intra-molecular cyclization.