Tentative Outline

Special Thematic Issue for Current Organic Chemistry

Title of thematic issue: 'Carbon-carbon and carbon-heteroatom bond forming reactions under greener conditions- part 2'

Guest Editor's Name, affiliation and email addresses:
Dr. Bubun Banerjee, Assistant Professor, Indus International University,
banerjeebubun@gmail.com

Aims & Scope:
Now-a-days, carbon-carbon and carbon-heteroatom bond-forming reactions are the backbone of synthetic organic chemistry. Scientists are constantly trying to develop new methods or modify techniques for such bond forming reactions leading to the syntheses of structurally diverse molecular entities. On the other hand, to save our '*Mother Nature*' from the ever increasing chemical pollution, scientists are continuously modifying their chemical processes to make them sustainable. As a result, last decade has shown a tremendous outburst to carry out carbon-carbon and carbon-heteroatom bond-forming reactions by following green credentials. This thematic issue intends to highlight the current progress on the development of carbon-carbon and carbon-heteroatom bond forming reactions with special emphasis on greener aspects. The submitted Review Article/Mini-review/Current Frontier should consist of novel approaches and related to recent advances based on the sustainable developments. Topics related to the green solvents and reusable catalytic systems are also welcome.

Topics of interest include, but are not limited to:

- C-C and C-heteroatom bond formations in aqueous medium
- C-C and C-heteroatom bond formations in non-conventional medium
- C-C and C-heteroatom bond formations via multi-component reactions
- C-C and C-heteroatom bond formations at ambient temperature
- C-C and C-heteroatom bond forming reactions under neat conditions
- Nano-catalyzed C-C and C-heteroatom bond forming reactions
- Photo-catalyzed C-C and C-heteroatom bond forming reactions
- Organo-catalyzed C-C and C-heteroatom bond forming reactions
- Ultrasound/microwave assisted C-C and C-heteroatom bond formations

Keywords:
Green Chemistry, sustainable developments, Carbon-Carbon bonds, C-heteroatom bonds, bioactive heterocycles

Subtopics along with Contributing authors and abstract

The subtopics to be covered within this issue are listed below:

Title no. 1: Facile Synthesis of Quinolines and Isoquinolines in Water

- **Author's name:** Prof. Bimal Krishna Banik*
- **Affiliation:** Department of Mathematics and Natural Sciences. College of Sciences and Human Studies, Deanship of Research Development, Al Khobar 31952, Kingdom of Saudi Arabia.
- **Email address:** bimalbanik10@gmail.com
- **Abstract:** Reactions in water have demonstrated surprising results. The effects of water in these reactions may include significant physical and chemical interactions with the substrates and catalysts through polar effects and hydrogen bonding ability. In some instances, water is also able to interact with the reaction intermediates and possibly with the transition states of chemical processes. Quinoline and isoquinolines are widely found heterocyclic cores in pharmaceutical as well as agrochemical

industry. In recent years, numerous reports have been documented to access quinoline and isoquinoline derivatives with structural diversity, either by new annulation or by novel ring functionalization. This review summarizes the recent significant advances in the synthesis of both these scaffolds in aqueous medium.

Title no. 2: One-pot Reaction in Organic Synthesis

- **Author's name:** Prof. Bimal Krishna Banik*
- **Affiliation:** Department of Mathematics and Natural Sciences. College of Sciences and Human Studies, Deanship of Research Development, Al Khobar 31952, Kingdom of Saudi Arabia.
- **Email address:** bimalbanik10@gmail.com
- **Abstract:** The one-pot reaction is an attractive method in synthetic chemistry. This method has numerous advantages over the multistep processes. The advantages of this method include green nature of the methods since many reactions are combined in a single reaction vessel. Therefore, this method is economical and efficient. In this perspective we focus on many one-pot catalytic and non-catalytic syntheses of biologically active molecules.

Title no. 3: An Updated Coverage on Synthesis of Benzo[b]thiophenes*via* Transition-Metal-Catalyzed Reactions: A Review

- **Author's name:** Dr. Komal Rizwan*
- **Affiliation:** Department of Chemistry, University of Sahiwal, Sahiwal, 57000, Pakistan.
- **Email address:** Komal.rizwan45@yahoo.com
- **Abstract:** The benzo[b]thiophene nucleus is ubiquitous in biologically and pharmaceutically important compounds. These moieties are highlyimportant in materials science. Synthesis of benzothiophene as a privileged structure has readily become a subject of great interest and actively pursued in recent years. This review focuses on facile and convenient methods of synthesis of benzo[b]thiophene based molecules through different transition metals catalyzed reactions.

Title no. 4: Green Methodologies Leading to Formation of New C-C and C-Heteroatom Bond

- **Author's name:** Prof. Neslihan Demirbas*
- **Affiliation:** Karadeniz Technical University, Department of Chemistry, 61080 Trabzon, Turkey.
- **Email address:** neslihan@ktu.edu.tr
- **Abstract:** Considering the growing environmental pollution influencing nearly every aspect of daily life, and its destructive effect on ecosystems, the discovery of new chemical methodologies, which contain the use of more eco-friendly chemicals, solvents, catalysts, atom economical procedures and alternative energy inputs have become an important subject in innovative green chemistry [1, 2].The ultimate target of green chemistry is to shift the traditional chemical processes, which use hazardous reagents, catalysts and/or toxic and volatile solvent, into environmentally innocent methodologies [3, 4].

  Among the methodologies targeting to fulfill the green chemistry concept, the use of metal-free organocatalyst as activator has supplied high selectivity and reproducibility in mild reaction conditions permitting of straightforward reaction setups [3].

  The superiorities of multicomponent reactions (MRCs), including high efficiency, minimized waste, reduced reaction time, easy work up procedures, compatibility with none-hazardous solvents have placed them in the centrum of green synthetic methodologies [4].

  Microwave and ultrasound assisted procedures, which enable an organic transformation at moderate reaction media, which otherwise require drastic conditions such as high temperature and pressure, have received great attention as other green procedures since their capability to develop safer, cleaner and energy efficient routes for synthetic strategies [2, 5]. In addition, the employment of ionic liquids (IL) as solvent, co-solvent and/or catalyst in combination with green heating technologies such as microwave, ultrasound have attracted a great deal [2].

  The application of several coupling and condensation reactions such as Suzuki, Mannich, Heck, Sonogashira, Aldol, Knoevenagel, Michael reactions under green conditions provides a most ecofriendly way to construct new C-C and C-heteroatom bonds enabling to access chemically and industrially important products easily.

- **Keywords:** Green Methodology, microwave, ultrasound, one-pot multicomponent reaction, ionic liquid.
- **References:**

1. Dekamin, M.G.; Eslami, M. *Green Chem.*,**2014**, *16*, 4914–4921.
2. Zarnegar, Z.; Safari, J. *New J. Chem*., **2016**, *40*, 7986-7995.
3. Alza, E.; Rodriguez-Escrich, C.; Sayalero, S.; Bastero, A.; Peric, M.A. *Chem. Eur. J*.,**2009**, *15*, 10167–10172.
4. Dekamin, M.G.; Peyman, S.Z.; Karimi, Z.; Javanshir, S.; Naimi-Jamal, M.R.; Barikani, M. *Int. J. Biol. Macromol.,***2016**, *87*, 172-179.
5. Amirnejad, M.; Naimi-Jamal, M.R.; Tourani, H.; Ghafuri, H. *Monatsh. Chem.,***2013**, *144*, 1219-1225.

Title no. 5: Formation of Carbon-Nitrogen Bond Mediated by Hypervalent Iodine Reagents Under Metal-free Conditions

- **Author's names:** Dr. Yunfei Du*
- **Affiliation:** Health Science Platform-School of Pharmaceutical Science and Technology (SPST) Tianjin University, 92 Weijin Road, Nankai District, Tianjin, 300072, P. R. China.
- **Email address:** duyunfeier@tju.edu.cn

- **Abstract:** In the past several decades, hypervalent iodine chemistry has witnessed prosperous development as hypervalent iodine reagents have been widely used in various organic transformations. Specifically, hypervalent iodine reagents have been widely used in various bond-forming reactions. Among these oxidative coupling reactions, the reactions involving the formation of C-N bond has been extensively explored to construct various heterocyclic skeletons and synthesize various useful building blocks. This review article is to summarize all the transformations in which carbon-nitrogen bond formation occurred by using hypervalent iodine reagents under metal-free conditions

- **Keywords**: Hypervalent iodine reagent, oxidative coupling, C-N bond formation, oxidation, metal-free conditions

Title no. 6: Xanthone Conjugates: Potential Agents for Multidrug Resistant Infection

- **Author's name:** Dr. Kamla Pathak*
- **Affiliation:** Pharmacy College Saifai, Uttar Pradesh University of Medical Sciences, Saifai, Etawah, 206130, Uttar Pradesh, India.
- **Email address:** kamlapathak5@gmail.com

- **Abstract:** Antibiotic resistance is a critical global health care crisis requiring urgent action to develop more effective antibiotics. Some studies have shown that hydrophobic scaffold of xanthone can be used to produce antibiotics with very promising antimicrobial activity against multidrug resistant gram positive as well as gram negative bacterial strains. One of the proposed mechanism of xanthone antibacterial activity is the involvement of bacteria,s cytoplasmic membrane. Several literature revealed that cationic modification of natural xanthone through the conjugation with amino acids and other polyamines may yield an amphillic structure with improved selectivity for bacterial membranes through the hydrophobic water interface perturbation. These designed xanthone conjugates may provide a new approach to modify natural compounds to yield excellent antimicrobial properties with high selectivity and safety. This strategy could improve hits in the development of new antibiotics for drug resistant pathogens.

- **Keywords**: xanthan derivatives, bacterial infections, antibiotic resistance

Title no. 7: p-Sulfonic Acid Calix[4]arene Catalyzed Organic Transformations: A Review

- **Author's name:** Dr. Bubun Banerjee
- **Affiliation:** Department of Chemistry, Indus International University, V.P.O- Bathu, Distt. Una, Himachal Pradesh, India.
- **Email address:** banerjeebubun@gmail.com

- **Abstract:** p-Sulfonic acid calix[4]arene is an efficient commercially available, low-cost, environmentally benign organocatalyst. In this review we will summarize diverse organic

transformations using p-sulfonic acid calix[4]arene as catalyst under various reaction conditions reported so far.

- **Keywords:** p-Sulfonic acid calix[4]arene; organocatalysis; sustainable developments; heteroycles

Schedule:

- Manuscript submission deadline: June 30, 2020.
- Peer Review Due: July 30, 2020.
- Revision Due: August 15, 2020.
- Announcement of acceptance by the Guest Editors: August 30, 2020.
- Final manuscripts due: September 15, 2020.

Contacts:

- **Guest Editor** Dr. Bubun Banerjee
- **Affiliation:** Assistant Professor, Indus International University, Una, Himachal Pradesh, India
- **Email:** banerjeebubun@gmail.com