

Dr. Siddharth Baranwal

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Area of teaching Interest:

Organic chemistry, Spectroscopy, Analytical chemistry.

Area of research interest:

Organic synthesis & methodology for heterocyclic amines.

Academic profile:

B.Sc.(Hons.) & M.Sc. (2009–2014) Institute of Science, Banaras Hindu University Varanasi, U.P., India.

Ph.D. (2017–2021) Department of Chemistry, Indian Institute of Technology (Banaras Hindu University) Varanasi.

Professional experience:

Organization: **HP Green R&D Centre Bengaluru**; Position: **Scientific Assistant** (2016–2017).

- Phase selective organogelators for oil spill recovery.
- Synthesis of polyol esters as potential Group-V lube oil.
- Development of group-IV lubes oil with novel methodology.
- Handling of sophisticated instruments such as **Ion exchange chromatography** (Dionex ICS-5000 DC), **X-ray fluorescence** (Bruker, S8 tiger) and **Induced coupled plasma- mass spectroscopy** (Perkin Elmer), **Liquid Chromatography** with RID, PDA and Mass detectors, **Gas Chromatography** with different detectors like TCD, FID and SCD.

Organization: **CSIR-Indian Institute of Petroleum, Dehradun**; Position: **Project fellow** (2015–2016).

- Development of **multifunctional additives** for biofuels and blended fuels.
- Study of a **novel phenolic-ester** as an antioxidant additive in lube, biodiesel and blended diesel.
- Handling and responsibility of **Parr reactors** for catalytic efficiency of heterogeneous catalyst in transesterification process, **Rancimat-743** (Metrohm) for thermal stability of Biodiesel.

Summary of Research work:

Sulfoximines have emerged as new and valuable pharmacophore in drug discovery. At present, some sulfoximine compounds are in different phases of clinical trials for various diseases. Moreover, sulfoximines were also explored in organic synthesis as building blocks, organocatalysts, ligands, chiral auxiliaries and directing groups, etc, In this context, the research work entitled, “**Development of new synthetic routes for the preparation of N-aryl, acyl and phosphoryl sulfoximines**” has demonstrated

various methods for *N*-functionalization of the sulfoximines. **The project 1** has disclosed copper catalyzed *N*-arylation of sulfoximines using aryldiazonium salts under mild conditions. **The project 2** has highlighted the development of catalyst-free and straightforward iminocarbonylation approach for the synthesis of *N*-acyl sulfoximines. **The project 3** has described the SeO₂-mediated α -keto *N*-acylation of *NH*-sulfoximines using acetophenones in the absence of any additives under mild reaction conditions. **The project 4** has demonstrated the copper(II) acetate mediated an efficient *N*-phosphorylation of sulfoximines with different dialkyl phosphites under mild reaction conditions³⁻⁶.

Recent publications:

- [1] R.K. Singh, A. Kukrety, O.P. Sharma, **S. Baranwal**, N. Atray, S.S. Ray, "Study of a novel phenolic-ester as antioxidant additive in lube, biodiesel and blended diesel," *Journal of Industrial and Engineering Chemistry*, 37 (2016) 27–31.
- [2] S. Gupta, **S. Baranwal**, N. Muniyappan, S. Sabiah, J. Kandasamy, "Copper-catalyzed *N*-arylation of sulfoximines with arylboronic acids under mild conditions," *Synthesis*, 51 (2019) 2171–2182.
- [3] S. Gupta, **S. Baranwal**, P. Chaudhary, J. Kandasamy, "Copper-promoted dehydrogenative cross-coupling reaction of dialkyl phosphites with sulfoximines," *Organic Chemistry Frontiers*, 6 (2019) 2260–2265.
- [4] **S. Baranwal**, S. Gupta, S. Sabiah, J. Kandasamy "Molybdenum-hexacarbonyl-mediated imino-carbonylative acylation of *NH*-sulfoximines with aryl iodides," *Asian Journal of Organic Chemistry*, 8 (2019) 2218–2227.
- [5] **S. Baranwal**, J. Kandasamy "Copper catalyzed *N*-arylation of sulfoximines with aryldiazonium salts in the presence of DABCO under mild conditions," *Tetrahedron Letters*, 61 (2020) 152079.
- [6] **S. Baranwal**, S. Gupta, J. Kandasamy, "Selenium dioxide promoted α -keto *N*-acylation of sulfoximines under mild reaction conditions," *Asian Journal of Organic Chemistry*, 8 (2021) 1835–1845.

Seminar & Symposium:

- [1] **National symposium** on contemporary trends and future prospects of functional materials (CTFM–2019) with poster presentation on the topic "Molybdenumhexacarbonyl mediated imino-carbonylative acylation of *NH*-sulfoximines with aryl iodides", November 29–30 2019, Department of Chemistry, Institute of Science, Banaras Hindu University, Varanasi (**The poster has been awarded for best poster presentation**).
- [2] **International DWIH workshop** on "Grant writing & management", by Indian offices of Max-Planck-Gesellschaft and University of Cologne, November 07–09 2019, Banaras Hindu University, Varanasi.

- [3] **National conference** on organic molecules as synthons & reagents for innovations (OMSRI–2019) with poster presentation during February 08–10 2019, Department of Chemistry, IIT Roorkee.
- [4] **National symposium** on emerging trends in chemical sciences (NSETCS–2018) with poster presentation on the topic “Cu catalyzed oxidative cross-coupling----under mild conditions”, November 17–18 2018, Department of Chemistry, Institute of Science, Banaras Hindu University, Varanasi.
- [5] **Institutional day** project presentation on “Cu catalyzed oxidative cross-coupling reaction of phosphites and sulfoximines to sulfoximine derived phosphoramidates under mild conditions”, February 16–18 2018, IIT (BHU Varanasi).
- [6] **International seminar** on “Challenges in sample preparation (Microwave digestion system) for ICP and ICP-MS spectrometers with consideration of USP-232”, February 24 2017, Bengaluru.
- [7] **Australia-India joint symposium** on “Nanoporous materials for clean energy applications”, March 8 2016, CSIR- Indian Institute of Petroleum, Dehradun.
- [8] **International conference** on recent advance in analytical science (RAAS–2014) March 27–29 2014, Department of Chemistry, Indian Institute of Technology Banaras Hindu University, Varanasi.
- [9] **Science academies’** lecture-workshop on supramolecular chemistry- concepts and perspectives, April 04–05 2014, Department of Chemistry, Mahila Maha Vidyalaya, Banaras Hindu University, Varanasi.
- [10] **Science academies’** lecture-workshop on spectroscopy in chemical biology, March 21–22 2014, Department of Chemistry, Faculty of Science, Banaras Hindu University, Varanasi.
- [11] **National education summit vibrant 2014** entitled with ‘*Towards Educating Young India*’ January 10–11 2014, by Education Department Government of Gujrat at Gandhinagar Gujarat.
- [12] **International 7th RSC-CRSI Symposium** in Chemistry, January 31 2013, by Department of Chemistry, Faculty of Science, Banaras Hindu University, Varanasi.
- [13] **15th CRSI National Symposium** in Chemistry, February 1–3 2013, by Department of Chemistry, Faculty of Science, Banaras Hindu University, Varanasi.