

Dr. Rahul Badru

(Ph.D., M.Sc., UGC-NET)

Assistant Professor

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Academic Summary

Area of specialisation: **Organic Chemistry**

- 2009-2013 : Ph.D. in Organic Chemistry
Thesis Title: **Synthesis of Heterocyclic Compounds through Cycloadditions of Nitrones and Azomethines with Active Dipolarophiles**
Supervisor: Prof. Baldev Singh, Department of Chemistry, Punjabi University, Patiala, India.
- 2007 : Qualified CSIR-UGC-NET (JRF) in Dec. 2007
- 2005-2007 : M.Sc. Organic Chemistry (with distinction), Department of Chemistry, Punjabi University, Patiala, India.
- 2002-2005 : B.Sc., Mohindra College, Punjabi University, Patiala, India.

Research Experience and Interests

Research experience as doctoral student, 5 years (2009-2013): PhD work focussed on synthesizing organic compounds of pharmacological value: isoxazolidines / pyrrolo isoxazoles through cycloadditions reactions, green synthesis of imidazolidines by carbonylation employing dialkyl carbonates.

Post-PhD Research Experience in the following fields: Organic Synthetic Chemistry (Cycloadditions, Carbonylation, Heterocycles synthesis), Ionic Liquids, organic-inorganic hybrid composite materials towards application in environmental remediation.

Teaching Experience

Position Held	Name of Organisation	Period		Nature of Work
		From	to	
Assistant Professor	Sri Guru Granth Sahib World University, Fatehgarh Sahib, Punjab	14.08.2014	continued	Teaching/Research

Assistant Professor	SGGS College, Sec-26, Chandigarh	18.09.2013	13.08.2014	Teaching
Lecturer	GCG, Patiala, Punjab	06.08.2007	15.03.2008	Teaching

Research Students:

Name of student	Class	Topic of research	Year of enrollment
Ashutosh Sharma	Ph.D.	<i>N</i> -alkylation of amines with dialkyl carbonates in the presence of Zirconium and Aluminium based MOFs and nanocomposites	2017
Khushboo	Ph.D.	Ionic liquid assisted synthesis of cabamates using dialkyl carbonates	2017
Monika	Ph.D.	Synthesis of Dihydropyrimidinones derivatives from naturally occurring substances using Biginelli Reaction	2017
Amanpreet Kaur	M.Sc.	Carbonylation of amines in the presence of ionic liquids as catalyst	2018
Harmanjot	M.Sc. (H)	1,3-dipolar cycloaddition of chalcone with various nitrones	2018
Gurinder Kaur	M.Sc. (H)	Cycloaddition of bis-nitrones with active dipolarophiles	2018
Khushboo	M.Sc.	Nanocomposite catalysed reduction of <i>p</i> -nitrophenol	2017
Heena Kumari	M.Sc.	Carbonylation of amines in the presence of composites	2017
Mandeep Kaur	M.Sc. (H)	Ionic Liquid Assisted Strecker reaction	2019
Opinder Kaur	M.Sc. (H)	1,3-Dipolar Cycloaddition of Glutaraldehyde based Bis-nitrones with Active Dipolarophiles (N-aryl maleimides)	2019
Narinder	M.Sc.	Green synthesis of copper nanoparticles using Cacumen Platycladi leaf extract	2019
Ranbir Kaur	M.Sc.	Green synthesis of copper nanoparticles and their application towards photocatalytic degradation of dye	2019

Research Publications in International Journals

1. Vanita Kumari, Rahul Badru, Sandeep Singh, Sandeep Kaushal*, Prit Pal Singh*, Synthesis and electrochemical behaviour of GO doped ZrP nanocomposite membranes, *Journal of Environmental Chemical Engineering* 8 (2020) 103690. (ISSN: 2213-3437)
2. Parul, Kamalpreet Kaur, Rahul Badru, Prit Pal Singh*, Sandeep Kaushal*, Photodegradation of organic pollutants using heterojunctions: A review, *Journal of Environmental Chemical Engineering*, 8 (2020) 103666. (ISSN: 2213-3437)
3. Sandeep Kaushal, Rahul Badru*, Harpreet K. Mann, Sanjeev Kumar and Pritpal Singh*, Efficient removal of cationic and anionic dye from their binary mixtures by adsorption over modified zirconium Phosphoborate. *J. Inorg. Organomet. Polym. Mater.* **2018**, 28(3), 968. (**Impact Factor: 1.754**) (ISSN: 1574-1451)
4. Sandeep Kaushal, J. K. Boparai, R. Kaur, Gurvir Singh, Tejwant S. Kang, Rahul Badru, Pritpal Singh, Pushpinder K. Sharma, Purification of Metagenomic DNA Using Novel Nanocomposite Titanium Dioxide-polyaniline Tin (IV) Antimonophosphate, Insights into the Mechanism Underlying Purification Process, *Current Biotechnology*. **2018**, 7(5), 349-354. (ISSN: 2211-551X)
5. Sandeep Kaushal, Rahul Badru, Pritpal Singh, Sanjeev Kumar and Susheel K Mittal, Estimation of Trace Level Cadmium (II) by Polyaniline-zirconium phosphoborate nanocomposite based membrane electrode. *Journal of Analytical Chemistry*. 2019, 74(8), 800-808. (ISSN: 1608-3199)
6. Sandeep Kaushal, Rahul Badru*, Sanjeev Kumar, Pushpender K. Sharma, Susheel K. Mittal and Pritpal Singh*, Electrochemical behavior of a membrane based on zirconium(IV) phosphoborate nanocomposite and its application in dye removal. *RSC Adv.*, **2016**, 6, 111606. (**Impact Factor: 2.936**) (ISSN: 2046-2069)
7. Sandeep Kaushal, Rahul Badru, Sanjeev Kumar, Susheel K. Mittal and Pritpal Singh*, Nanocomposite zirconium phosphoborate ion-exchanger incorporating carbon nanotubes with photocatalytic activity. *Separation Science and Technology*, 51(18), **2016**, 2896. (**Impact Factor: 1.083**) (ISSN: 1520-5754)
8. Sandeep Kaushal, Rahul Badru, Sanjeev Kumar, Susheel K. Mittal and Pritpal Singh*, Fabrication of a mercury(II) ion selective electrode based on poly-*o*-toluidine-zirconium phosphoborate. *RSC Adv.*, **2016**, 6, 3150. (**Impact Factor: 2.936**) (ISSN: 2046-2069)
9. Rahul Badru and Baldev Singh, Synthesis of imidazolidin-2-ones employing dialkyl carbonates as eco-friendly carbonylation source. *RSC Adv.*, **2014**, 4, 38978. (**Impact Factor: 2.936**) (ISSN: 2046-2069)
10. Rahul Badru and Baldev Singh, Triethylamine catalysed synthesis of oxazepine from maleamic acids. *Journal of Heterocyclic Chemistry*, **2015**, 52(3), 635. (ISSN: 1943-5193, **Impact Factor: 1.141**) (ISSN: 1943-5193)
11. Sakshi Shah, Rahul Badru and Baldev Singh, Diastereoselective synthesis of novel Spiro-isoxazolidines via [3+2] cycloaddition. *Synthetic Communications*. **2013**, 43, 1073-1082. (ISSN: 1532-2432, **Impact Factor: 1.065**) (ISSN: 1532-2432)
12. Rahul Badru, PreetAnand and Baldev Singh, Synthesis and evaluation of hexahydropyrrolo[3,4-d]isoxazole-4,6-diones as anti-stress agents, *European Journal of Medicinal Chemistry*. **2012**, 48, 81-91. (ISSN: 0223-5234, **Impact Factor: 4.816**) (ISSN: 0223-5234)

13. Rahul Badru, Sakshi Shah and Baldev Singh, 1,3-Dipolar cycloaddition reactions of 2-substituted azomethine *N*-oxides with *N*-benzyl maleimides leading to the synthesis of stereoisomers. *Journal of Heterocyclic Chemistry*. **2012**, 49, 336-341. (ISSN: 1943-5193, **Impact Factor: 1.141**) (ISSN: 1943-5193)

Invited Talk/Lecture/Chairing Session

1. Chaired "Oral Presentations-I" Session at Recent Trends in Chemical and Environmental Sciences-2019" (RTCES-2019) held at Punjabi University, Patiala, Punjab-India on 8th Feb 2019.
2. Delivered a guest lecture on "Chemistry in everyday life" at GNE University, Phagwara, Punjab, India in 2017.

International/National Conferences/Seminars Participated

1. NPICS-SAP, Feb 9-10, 2017, Punjabi University, Patiala-poster presentation
2. National Seminar "*New Paradigm in Chemical Sciences*" Feb 13, 2014, Punjabi Univ., Patiala –poster presentation
3. National Seminar on "*Chemistry for a better tomorrow: Current Trends and Challenges*" March 8, 2014, Mata Gujri College, Fatehgarh Sahib - poster presentation
4. Two-days National Seminar "*New Frontiers in Chemistry*" Feb 15-16, 2013, Punjabi Univ., Patiala –poster presentation
5. International Conference "*Chemical Constellation Cheminar – 2012*" [CCC-2012], Sept 10-12, Dr B R Ambedkar National Institute of Technology, Jalandhar – poster presentation
6. National Conference on Global Challenges: *New Frontiers in Chemical Sciences* (GC: NFCS-2012), Sept 22-23, Kurukshetra University, Kurukshetra– poster presentation
7. Two-days National Seminar, "NSCIDS" -Feb 15-16,2012, Punjabi Univ., Patiala
8. *International Conference on Innovations in Chemistry for Sustainable Development* (Dec 3-5, ICSD-2011), Panjab Univ. Chandigarh
9. Prof. Ram Paul International Conference -Feb 11-12, 2011, Panjab Univ. Chandigarh
10. National conference *RACES*-Feb. 28-March 1,2011, Multani Mal Modi College, Patiala
11. Two-days National Seminar, "NSRACE" -Feb 15-16, 2011, Punjabi Univ., Patiala
12. Two-days National Seminar, Feb 15-16, 2010, Punjabi Univ., Patiala
13. National conference *RACES*-Jan 16-17, 2009, Multani Mal Modi College, Patiala
14. Two-days National Seminar, "NSCIDS" -Jan 21-22, 2009, Punjabi Univ., Patiala

Positions/Responsibilities held:

1. Organised a National Conference as **Convener** on "Research in Chemical Sciences: Current Scenario-2018" at SGGSWU, Fatehgarh Sahib, Punjab, India.
2. Member of Indian Science Congress
3. Member of RDC (Research Degree Committee)

4. Board of studies member (2017-18, 2018-20)
5. Reviewer of Journals - JOC (ACS), RSC Advances (RSC), European Journal of Medicinal Chemistry (Elsevier), Fibres and polymers (Springer).

Awards/Fellowships

1. Awarded **Senior Research Fellowship** (SRF) from 18.06.2011 to 19.08.2013 by University Grants Commission, India.
2. Awarded **Junior Research Fellowship** (JRF) from 18.06.2009 to 17.06.2011 by University Grants Commission, India.