

Personal Profile



Dr. Md. Harunar Rashid

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Educational Profile

- Ph.D. Indian Association for the Cultivation of Science (Jadavpur University), Kolkata, West Bengal; 2009
Supervisor: Prof. Tarun Kumar Mandal
- M.Sc. Gauhati University, Guwahati, Assam; 2001
Subject: Chemistry
Specialization: Physical Chemistry
- B.Sc. Gauhati University, Guwahati, Assam; 1998
Subject: Chemistry (Major)

Professional Experience

- Assistant Professor**, Department of Chemistry, Rajiv Gandhi University, Arunachal Pradesh, India June, 2012–till date
- Assistant Professor**, Department of Chemistry, Central University of Rajasthan, Rajasthan, India August, 2011–May, 2012
- Post-doctoral Fellow**, Cornell University, USA July, 2009–August 2011
Supervisor: Prof. Emmanuel P. Giannelis

Administrative Experience

- Head of Department**, Department of Chemistry, Rajiv Gandhi University, Arunachal Pradesh, India July, 2014–July 2016
- Member**, Training & Placement Cell, Rajiv Gandhi University, Arunachal Pradesh, India February 2018
- Convener**, CIF Committee, Rajiv Gandhi University, Arunachal Pradesh, India February, 2016

Awards & Honours

1. INSA Visiting Fellowship by the Indian National Science Academy, India, (2014-2015)
2. Science Academies Summer Research Fellowship by IASc-NASI-INSA, India (2013)
3. Young Scientist Fellowship by DST-SERB, India (2011)
4. Qualified CSIR-UGC NET for CSIR-JRF, 2004
5. Qualified GATE, 2004
6. National Merit Scholarship, 1995

Membership of Professional Bodies

1. Member of the Association of Chemistry Teachers, India (2017/ Life Member)

Research Interests

- Size and shape tunable metal oxide nanoparticles
- Surface engineering of nanostructured materials
- Heterogeneous catalysis
- Water treatment

Research Publications

1. NiFe₂O₄ nanoparticles: An efficient and reusable catalyst for the selective oxidation of benzyl alcohol to benzaldehyde under mild conditions; Iraqui, S.; Kashyap, S. S.; Rashid, Md. H.; *Nanoscale Adv.* **2020**, *2*, 5790–5802.
2. Facile synthesis of chitosan-modified ZnO/ZnFe₂O₄ nanocomposites for effective remediation of groundwater fluoride; Sarma, G. K.; Sharma, R.; Saikia, R.; Borgohain, X.; Iraqui, S.; Bhattacharyya, K. G.; Rashid, Md. H.; *Env. Sci. Pollut. Res.* **2020**, *27*, 30067–30080.
3. Rapid and extremely high adsorption performance of porous MgO nanostructures for fluoride removal from water; Borgohain, X.; Boruah, A.; Sarma, G. K.; Rashid, Md. H.; *J. Mol. Liq.* **2020**, *305*, 112799.
4. Green synthesis of CuO nanoparticles using *Lantana camara* flower extract and their potential catalytic activity towards the aza-Michael reaction; Chowdhury, R.; Khan, A.; Rashid, Md. H.; *RSC Adv.* **2020**, *10*, 14374–14385.
5. Generation of anisotropic Au nanostructures in aqueous carboxymethyl cellulose matrix for potential catalytic application; Borgohain, X.; Yomcha, J.; Khan, A.; Rashid, Md. H.; *ChemistrySelect* **2019**, *4*, 14253–14260.

6. Shape-tunable CuO-Nd(OH)₃ nanocomposites with excellent adsorption capacity in organic dye removal and regeneration of spent adsorbent to reduce secondary waste; Sarma, G. K.; Khan, A.; El-Toni, A. L.; Rashid, Md. H.; *J. Hazard. Mater.* **2019**, *380*, 120838.
7. Green chemical synthesis of Pd nanoparticles for use as efficient catalyst in Suzuki-Miyaura cross-coupling reaction; Phukan, S.; Mahanta, A.; Kakati, D.; Rashid, Md. H.; *Appl. Organometal. Chem.* **2019**, *33*, e4758.
8. Use of invasive weed to synthesize shape-tunable gold nanoparticles and evaluation of their catalytic activities in dye reduction; Phukan, S.; Kakati, D.; Rashid, Md. H.; *Curr. Nanosci.* **2018**, *14*, 511–519.
9. Synthesis of Mg/Al layered double hydroxides for adsorptive removal of fluoride from water: A mechanistic and kinetic study; Sarma, G. K.; Rashid, Md. H.; *J. Chem. Eng. Data* **2018**, *63*, 2957–2965.
10. Size-tunable ZnO nanotapes as an efficient catalyst for oxidative chemoselective C–B bond cleavage of arylboronic acids; Phukan, S.; Mahanta, A.; Rashid, Md. H.; *Appl. Catal. A* **2018**, *562*, 58–66.
11. Biogenic synthesis of shape-tunable Au-Pd alloy nanoparticles with enhanced catalytic activities; Chowdhury, R.; Mollick, Md. M. R.; Biswas, Y.; Chattopadhyay, D.; Rashid, Md. H.; *J. Alloys Compd.* **2018**, *763*, 399–408.
12. Green route biosynthesis of shape tunable ZnO nanostructures and their photocatalytic applications; Phukan, S.; Bomjen, P.; Shripathi, T.; Rashid, Md. H.; *ChemistrySelect* **2017**, *2*, 11137–11147.
13. Catalytically active network-like gold nanostructures: Synthesis and study of growth mechanism; Rashid, Md. H.; *Ind. J. Chem. A* **2017**, *56A*, 1111–1121.
14. Facile biopolymer assisted synthesis of hollow SnO₂ nanostructures and their application in dye removal; Chowdhury, R.; Barah, N.; Rashid, Md. H.; *ChemistrySelect* **2016**, *1*, 4682–4689.
15. Phytochemical assisted synthesis of size and shape tunable gold nanoparticles and assessment of their catalytic activities; Phukan, S.; Bharali, P.; Das, A. K.; Rashid, Md. H.; *RSC Adv.* **2016**, *6*, 49307–49316.
16. Synthesis of magnetic nanostructures: Shape tuning by the addition of a polymer at low temperature; Rashid, Md. H.; Raula, M.; Mandal, T. K.; *Mater. Chem. Phys.* **2014**, *145*, 491–498.
17. In situ formation of chiral core–shell nanostructures with raspberry-like gold cores and dense organic shells using catechin and their catalytic application; Raula, M.; Maity, D.; Rashid, Md. H.; Mandal, T. K.; *J. Mater. Chem.* **2012**, *22*, 18335–18344.

18. Solvent-adoptable polymer Ni/NiCo alloy nanochains: Highly active and versatile catalysts for various organic reactions in both aqueous and non-aqueous media; Raula, M.; Rashid, Md. H.; Lai, S.; Roy, M.; Mandal, T. K.; *ACS Appl. Mater. Interfaces* **2012**, *4*, 878–889.
19. Correlation between catalytic activity and surface ligands of monolayer protected gold nanoparticles; Biswas, M.; Dinda, E.; Rashid, Md. H.; Mandal, T. K.; *J. Colloid Interface Sci.* **2012**, *368*, 77–85.
20. Polymer assisted synthesis of chain-like cobalt-nickel alloy nanostructures: Magnetically recoverable and reusable catalysts with high activities; Rashid, Md. H.; Raula, M.; Mandal, T. K.; *J. Mater. Chem.* **2011**, *21*, 4904–4917.
21. Redox-active ionic-liquid-assisted one-step general method for preparing gold nanoparticle thin films: Applications in refractive index sensing and catalysis; Dinda, E.; Rashid, Md. H.; Biswas, M.; Mandal, T. K.; *Langmuir* **2010**, *26*, 17568–17580.
22. Ascorbate-assisted growth of hierarchical ZnO nanostructures: Sphere, spindle, and flower and their catalytic properties; Raula, M.; Rashid, Md. H.; Paira, T. K.; Dinda, E.; Mandal, T. K.; *Langmuir* **2010**, *26*, 8769–8782.
23. Amino acid-based redox active amphiphiles to *in situ* synthesize gold nanostructures: From sphere to multipod; Dinda, E.; Rashid, Md. H.; Mandal, T. K.; *Cryst. Growth Des.* **2010**, *10*, 2421–2433.
24. Low temperature polymer-assisted synthesis of shape-tunable zinc oxide nanostructures dispersible in both aqueous and non-aqueous media; Rashid, Md. H.; Raula, M.; Bhattacharjee, R. R.; Mandal, T. K.; *J. Colloid Interface Sci.* **2009**, *339*, 249–258.
25. Environmentally benign *in situ* synthesis of gold nanotapes using carboxymethyl cellulose; Bhattacharjee, R. R.; Rashid, Md. H.; Mandal, T. K.; *J. Nanosci. Nanotechnol.* **2008**, *8*, 3610–3615.
26. Templateless synthesis of polygonal gold nanoparticles: An unsupported and reusable catalyst with superior activity; Rashid, Md. H.; Mandal, T. K.; *Adv. Funct. Mater.* **2008**, *18*, 2261–2271.
27. Synthesis and catalytic application of nanostructured silver dendrites; Rashid, Md. H.; Mandal, T. K.; *J. Phys. Chem. C* **2007**, *111*, 16750–16760.
28. Organic ligand-mediated synthesis of shape-tunable gold nanoparticles: An application of their thin film as refractive index sensors; Rashid, Md. H.; Bhattacharjee, R. R.; Mandal, T. K.; *J. Phys. Chem. C* **2007**, *111*, 9684–9693.
29. Synthesis of spongy gold nanocrystals with pronounced catalytic activities; Rashid, Md. H.; Bhattacharjee, R. R.; Kotal, A.; Mandal, T. K.; *Langmuir* **2006**, *22*, 7141–7143.

Patents

1. Kanj, M. Y.; Rashid, Md. H.; Giannelis, E. P.; *Carbon-based Fluorescent Tracers as Oil Reservoir Nano-agents*, US Patent 10,119, 072 B2, November 06, 2018
2. Kanj, M. Y.; Rashid, Md. H.; Giannelis, E. P.; *Carbon-based Fluorescent Tracers as Oil Reservoir Nano-agents*, US Patent 10,047,283 B2, August 14, 2018
3. Kanj, M. Y.; Rashid, Md. H.; Giannelis, E. P.; *Carbon-based Fluorescent Tracers as Oil Reservoir Nano-agents*, US Patent 9, 528,045 B2, December 27, 2016
4. Kanj, M. Y.; Rashid, Md. H.; Giannelis, E. P.; *Carbon-based Fluorescent Tracers as Oil Reservoir Nano-agents*, US Patent 9,493,700 B2, November 15, 2016
5. Kanj, M. Y.; Rashid, Md. H.; Giannelis, E. P.; *Carbon-based Fluorescent Tracers as Oil Reservoir Nano-agents*, US Patent 9,469,599 B2, October 18, 2016
6. Kanj, M. Y.; Rashid, Md. H.; Giannelis, E. P.; *Carbon-based Fluorescent Tracers as Oil Reservoir Nano-agents*, US Patent 9,464,034 B2, October 11, 2016
7. Kanj, M. Y.; Rashid, Md. H.; Giannelis, E. P.; *Carbon-based Fluorescent Tracers as Oil Reservoir Nano-agents*, US Patent 9,453,159 B2, September 27, 2016
8. Kanj, M. Y.; Rashid, Md. H.; Giannelis, E. P.; *Carbon-based Fluorescent Tracers as Oil Reservoir Nano-agents*, US Patent 9,447,682 B2, September 20, 2016

Research guidance

Post-doc fellow

1. Gautam Kumar Sarma, PhD

Topic of research: Hierarchical layered double hydroxide (LDH) nanocomposites: Preparation, characterization and application as adsorbent for removal of fluoride from drinking water

Period: 2016–2018

Ph.D scholar

1. Tulan Chandra Saikia

Topic of research: Synthesis of metal oxide nanostructures for applications in catalysis

Year of PhD degree: Ongoing

2. Xavy Borgohain

Topic of research: Synthesis of selected metal oxide/ hydroxide based adsorbents for pollutant removal from water

Year of PhD degree: Ongoing

3. Saddam Iraqui

Topic of research: Synthesis of MFe_2O_4 ($M^{2+} = Cu^{2+}, Zn^{2+}, Co^{2+},$ and Ni^{2+}) nanoparticles for use as reusable catalysts in selected organic reactions

Year of PhD degree: Ongoing

4. Babul Kalita

Topic of research: Effect of additives on size, shape and catalytic activity of some selected magnetic ferrites

Year of PhD degree: Ongoing

5. Rakesh Chowdhury

Topic of research: Size and shape controlled synthesis of metal oxide and bimetallic alloy nanostructures and their applications

Year of PhD degree: 2021

Present occupation: Subject Teacher, Asian Public School, North Lakhimpur, Assam

6. Shreemoyee Phukan

Topic of research: Designing metal and metal oxide nano-catalysts for applications in organic reactions

Year of PhD degree: 2019

Present occupation: Assistant Professor, Silapathar College, Assam

Course/Conference/Workshop organized

1. Science Academies' Virtual Lecture Workshop on Green and Sustainable Chemistry by Department of Chemistry, Rajiv Gandhi University, Arunachal Pradesh, India

Duration: 17 December–18 December, 2020

Role: Coordinator

2. Salters' Chemistry Camp by Department of Chemistry, Rajiv Gandhi University, Arunachal Pradesh, India

Duration: 29 January–31 January, 2019

Role: Coordinator

Course attended

1. Attended UGC–Sponsored 33rd Orientation Programme at UGC–HRDC, NEHU Shillong from 18 May–14 June, 2015.
2. Attended UGC–Sponsored Refresher Course in Nano Science and Nano Technology at UGC–HRDC, GU, Guwahati from 22 March–11 April, 2017.
3. Attended NPTEL–AICTE–Sponsored Faculty Development Programme in Analytical Chemistry from July–October 2019.

Conference/Workshop etc. attended

1. Delivered an invited talk in 'Prospect of Research & Innovation in Science: A post Covid-19 Pandemic Outlook', a Webinar held at Rajiv Gandhi University, Doimukh, India on 10 June, 2020.

Title of the talk: Nanostructured materials for treatment of polluted water

2. Delivered an oral presentation in '6th International Conference on Advanced Nanomaterials and Nanotechnology', an international conference held at Indian Institute of Technology, Guwahati, India during 18–21 December, 2019.

Title of the talk: Shape-tunable CuO-Nd(OH)₃ nanocomposites with excellent adsorption capacity in organic dye removal

3. Delivered an invited talk in 'National Symposium on Recent Trends in Chemistry', a national symposium held at North-Eastern Hill University, Shillong, India during 31 October–01 November, 2019.

Title of the talk: Designing functional nanocomposites for treatment of contaminated water

4. Delivered an invited talk in 'Inter-University Accelerator Centre Acquaintance Workshop', a national workshop held at Rajiv Gandhi University, Doimukh, India on 25 April, 2019.

Title of the talk: Synthesis, characterization and application of nanostructured materials

5. Presented a poster in 'Indus Synchrotrons User's Meeting', a user's meeting held at UGC-DAE Consortium of Scientific Research, Indore, India during 27–29 March, 2019.

Title of the presentation: Electronic structure studies of size and shape tunable magnetic ferrites and their catalytic applications

6. Delivered an oral presentation in 'International Conference on Modern Trends in Chemical Sciences Including Green Chemistry', an international conference held at SRM Institute of Science and Technology, Chennai, India during 27–29 December, 2018.

Title of the presentation: Synthesis of tape-like zinc oxide nanostructures for use as catalyst in organic reactions

7. Delivered an oral presentation in 'International Conference on Emerging Trends in Chemical Science', an international conference held at Dibrugarh University, Dibrugarh, India during 26–28 February, 2018.

Title of the presentation: Green chemical synthesis of metal oxide nanostructures for use as catalyst in organic reactions

8. Delivered an oral presentation in '5th International Conference on Advanced Nanomaterials and Nanotechnology', an international conference held at Indian Institute Technology, Guwahati, India during 18–21 December, 2017.

Title of the presentation: Synthesis of shape tunable metal oxide nanostructures for catalytic applications

9. Delivered an oral presentation in 'International Conference on Advances in Nanomaterials and Nanotechnology,' an international conference held at Jamia Millia Islamia, Delhi, India during 4–5 November, 2016.

Title of the presentation: Biomolecules assisted shape tuning of metal oxide nanostructures and their applications

10. Delivered an invited talk in 'Advances in Nanostructured Materials: Applications and Perspectives', a workshop held at Kaziranga University, Jorhat, India during 1–2 June, 2016.

Title of the talk: Biomolecules assisted size and shape tuning of metal and metal oxide nanostructures and their applications

11. Delivered an oral presentation in '4th International Conference on Advanced Nanomaterials and Nanotechnology', an international conference held at Indian Institute Technology, Guwahati, India during 8–11 December, 2015.

Title of the presentation: Biomolecules assisted synthesis of size and shape tunable metal oxide nanostructures

12. Delivered an oral presentation in 'Conference on Contemporary Developments in Chemical Sciences', a national conference held at Tezpur University, Tezpur, India during 23–24 November, 2015.

Title of the presentation: Size and shape tunable metal and metal oxide nanostructures: synthesis, characterization and applications

13. Delivered an oral presentation in 'International Symposium on Polymer Science and Technology', an international symposium held at Indian Association for the Cultivation of Science, Kolkata, India during 23–26 January, 2015.

Title of the presentation: Polymer assisted synthesis of metal oxide nanostructures

14. Delivered an invited talk in 'National Conference on New Advances and Horizons in Nanoscience and Nanotechnology', a national conference held at Institute of Advanced Study in Science and Technology, Guwahati, India during 20–21 December, 2014.

Title of the talk: Use of metal nanoparticles as efficient catalyst for organic reactions

15. Presented a poster in '6th International Conference on Nano Science and Technology', an international conference held at Institute of Nano Science and Technology, Punjab, India during 3–5 March, 2014.

Title of the presentation: Application of surface functionalized nanoparticles in enhanced oil recovery

16. Presented a poster in '3rd International Conference on Advanced Nanomaterials and Nanotechnology', an international conference held at Indian Institute Technology, Guwahati, India during 1–3 December, 2013

Title of the presentation: Colloidal nanoparticles as efficient and reusable catalyst for organic reactions

17. Delivered an oral presentation in '5th Asian Conference on Colloid and Interface Science', an international conference held at North Bengal University, Darjeeling, India during 20–23 November, 2013.

Title of the presentation: Surface functionalized nanoparticles for application in emerging areas

18. Delivered an oral presentation in 'International Conference on Nano Science and Technology', an international conference held at International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad, India during 20–23 January, 2012.

Title of the presentation: Nanostructured materials for application in emerging areas

19. Presented a poster in 'International Conference on Nano Science and Technology', an international conference held at Indira Gandhi Centre for Atomic Research, Kalpakkam, India during 27–29 February, 2008.

Title of the presentation: Synthesis of anisotropic gold and silver nanostructures and their catalytic application

20. Presented a poster in '9th National Symposium in Chemistry', a national symposium held at Delhi University, New Delhi, India during 1–4 February, 2007.

Title of the presentation: Synthesis of dendritic silver nanoparticles by modified citrate reduction method

21. Presented a poster in 'International conference on Recent Trends in Nanoscience and Technology,' an international conference held at Jadavpur University, Kolkata, India during 7–9 December, 2006.

Title of the presentation: Synthesis of spongy gold and flower-like silver nanocrystals

22. Presented a poster in 'International Conference on Laser and Nanomaterials', an international conference held at Calcutta University, Kolkata, India during 30 November–2 December, 2006.

Title of the presentation: Synthesis, characterization and application of shape-tunable gold nanoparticles

23. Presented a poster in 'National Conference on Frontiers in Polymer Science and Technology', a national conference held at Indian Association for the Cultivation of Science, Kolkata during 10–12 February, 2006.

Title of the presentation: Polyelectrolyte-mediated assembly of thermoresponsive gold nanoparticles

24. Presented a poster in 'National Symposium on Chemistry at the Inorganic and Organic Interphase', a national symposium held at Indian Institute Technology, Guwahati, India during 6–7 December, 2004.

Title of the presentation: Use of organic structures in starch for shape selective inorganic nanomaterials preparation and solubilization of polymer

Sponsored Project

Title of the project	Funding agency	Year of sanction	Role
Electronic structure studies of size and shape tunable magnetic ferrites and their catalytic applications	UGC-DAE CSR	2020	PI
Bio-polymer/ metal hydroxides nanocomposites for mitigating fluoride from water	SERB	2020	PI
Biogenic synthesis of size and shape tunable noble metal and bimetallic alloy nanoparticles for catalytic applications	CSIR	2017	PI
Designing supported metal nanocatalysts for application in C–C coupling reactions	SERB	2016	PI
Transition metal oxide nanoparticles for sensor applications	UGC – DAE CSR	2014	PI
Design, synthesis and application of hollow metal oxide nanostructures	SERB, DST	2013	PI