

Dr. Mohammad Mahbubur Rahman

mahbub.bcsir@ yahoo.com, mahbub@bcsir.gov.bd +880 1911776171 Dhaka, Bangladesh

Office: Fiber & Polymer Research Division, BCSIR Dhaka Laboratories

Bangladesh Council of Scientific and Industrial Research (BCSIR)

Dr. Qudrat-E-Khuda Road, Dhaka-1205, Bangladesh

Education

Ph.D. in Materials Sciences 2024

Department of Chemistry, University of Dhaka, Bangladesh

M. Phil in Materials Sciences 2010

Department of Materials and Metallurgical Engineering,
Bangladesh University of Engineering and Technology
(BUET), Dhaka, Bangladesh

M.S. in Chemistry 2002

University of Dhaka, Dhaka-1000, Bangladesh

B.Sc. (Hons) in Chemistry 2001

University of Dhaka, Dhaka-1000, Bangladesh.

Professional Experiences

Principal Scientific Officer (PSO) 2023-Present

BCSIR Dhaka Laboratories, Bangladesh Council of Scientific
and Industrial Research (BCSIR)

Senior Scientific Officer (SSO) 2012-2023

BCSIR Dhaka Laboratories, Bangladesh Council of Scientific
and Industrial Research (BCSIR)

Scientific Officer (SO) 2006-2012

Leather Research Institute (LRI), Bangladesh Council of
Scientific and Industrial Research (BCSIR)

Project Grants

Principal Investigator (Year 2023-2026)

Special Allocation Project, Ministry of Science and Technology, Government of Bangladesh.

- “Eco-friendly Synthesis and Characterization of Nano-Carboxymethyl Cellulose from Renewable Hardwood Pulp for Controlled Drug Delivery Application” (SRG-256604 & Sl. No.- PS 604)” (Year 2025-2026).
- “Green Synthesis of Nanocellulose-Zero Valent Iron Adsorbent for Heavy Metal Removal from Wastewater”- (SRG-243327 & Sl. No.- ES 327)” (Year 2024-2025).

- Synthesis of organic acid hydrolyzed nanocellulose-based composite for high-energy supercapacitor electrodes (SRG-236621) (Year 2023-2024).

Research and Development (R&D) Experiences

- Project Title: “Synthesis of Bio-adsorbent from Lignocellulosic Biomass for Waste Water Treatment”. BCSIR Dhaka Laboratories (July 2024- June 2026).
- Project Title: “Synthesis of Non-ionic Emulsifiers from Fatty Acids and Polyhydroxy Alcohols (July 2024- June 2026).
- Project Title: “Synthesis and computational studies of Aroylhydrazinato metal complex based Liquid crystals (July 2024- June 2026).
- Project Title: “Extraction and characterization of bio polymer from shrimp shell waste using green solvents (July 2024- June 2026).
- Project Title: “Cellulose-clay nanocomposite for the effective removal of heavy metals from industrial wastewater. (July 2023 -June 2025)
- Project Title: “Synthesis of water-soluble chitosan from shrimp processing waste” (July 2023- June 2025)
- Project Title: “Synthesis of Organic Acid Hydrolyzed Cellulose Nanocrystals and Its Applications” (July 2023- June 2025)
- Project Title: “Thermo-mechanical recycling of plastic for sustainable environment” (July 2023- June 2025)
- Project Title: Removal of textile dyes and heavy metals using microwave exfoliated graphene” (July 2022 -June 2024)
- Project Title: Synthesis, molecular docking and DFT computational studies of diamine and pyrimidine-based Schiff-bas derivatives” (July 2022- June 2024)
- Project Title: Synthesis, molecular docking and DFT computational studies of diamine and pyrimidine-based Schiff-bas derivatives” (July 2022 -June 2024)
- Project Title: Synthesis of biological active chitosan derivatives as natural preservatives (P h a set-1)” (July 2021-June 2022)
- Project Title: Synthesis of functionalized porous activated carbon derived from lignocellulosic biomass for environmental remediation” July 2021. June 2022
- Project Title: “Development and application of industrially important cellulose derivatives (HPMC, MC, CMC, Cellulose acetate etc.)” (July 2019- June 2020)

- **Publications**

Over 40 peer-reviewed articles on topics including circular economy, waste valorization, and renewable energy.

1. Sweetey, Mirza Nusrat, Shamima Akther Eti, Muhammad Amirul Hoque, Mohammad Shahid Ullah, Shabiba Parvin Shandhi, Fariha Chowdhury, Md Khabir Uddin Sarker,

- Sarna Khanam, Farid Ahmed, and Mohammad Mahbubur Rahman. "Upcycling boiler fuel rice-husk waste: a sustainable cellulose–clay nanocomposite for lead remediation." *RSC advances* 16, no. 16 (2026): 14420-14438.
2. Mosharraf, Adiba, Ferdousi Begum, Modhuparna Dey, Mohammad Mahbubur Rahman, Md Abu Bin Hasan Susan, Farhana Akter, Imtiaz Ahmed Sakib, and Md Arman Hossain. "Microplastic Pollution in the Surface Water of Karnaphuli Estuary: Understanding Spatial Variation and Ecological Impacts." *Dhaka University Journal of Science* 74, no. 1 (2026): 36-45.
 3. Mouna, Snigdha SP, Mohammad Mohinuzzaman, Protima Sarkar, Shamima Akther Eti, M. M. Rahman, Md Abdus Sabur, Khan MG Mostofa, Leonard Tijing, Ho Kyong Shon, and Mohammad Mahbub Kabir. "Functionalized peanut-shell (*Arachis hypogaea*)-derived layered double hydroxides adsorbents for the effective remediation of Azithromycin contaminated wastewater." *Desalination and Water Treatment* (2026): 101658.
 4. Bhuiyan, Riyadh Hossen, Mohammad Mahbubur Rahman, Md Masum Billah, Md Fardin Ehsan, Taslima Akter, Md Shakhawoat Hossain, Md Mamunur Rashid, Md Saiful Islam, and Swapan Kumer Ray. "Bio-adsorbent for wastewater treatment: amination of green coconut husk waste-derived lignin for the removal of Congo red dye." *RSC advances* 16, no. 3 (2026): 2093-2111.
 5. Mohammad Mahbubur Rahman Md. Abu Bin Hasan Susan Modhuparna Dey, Adiba Mosharraf, Ferdousi Begum, "Microplastic load and distribution in the respiratory and digestive systems of some commercial fish species in the southwestern coast of Bangladesh" *Bangladesh Journal of Oceanography*, 1(1), (2026): 95-115
 6. Pathan, Md Maynuddin, Md Rakeb-Ul-Islam, Khadiza Nasrin, Khadijatul Kubra Riya, Md Mahbubur Rahman, Md Maheen Mahmud Bappy, Partho Banik et al. "Characterization and risk assessment of microplastic contamination in the Kaptai Lake and adjacent water using multi-approach analysis." *Journal of Contaminant Hydrology* (2025): 104770.
 7. Hasan, Md Shaikat, M. Mahbubur Rahman, Md Kamrul Hasan, Md Shakhawoat Hossain, Riyadh Hossen Bhuiyan, Md Tushar Uddin, Samar Kumar Guha, and M. Sarwar Jahan. "Plasma Modification of Jute Cellulose for Enhanced Carboxymethylation Reaction." *ChemistrySelect* 10, no. 32 (2025): e03048.
 8. Shourove, Jahid Hasan, GM Rabiul Islam, Shamima Akther Eti, and Mohammad Mahbubur Rahman. "Migration of heavy metals from disposable food containers to food and potential health risks." *Journal of Food Composition and Analysis* 144 (2025): 107686.
 9. Bappy, Md Maheen Mahmud, Md Mofizur Rahman, Md Tareque Bhuiyan, Mohammad Mahbubur Rahman, Partho Banik, As-Ad Ujjaman Nur, Jimmy Yu et al. "Contamination, potential sources, and risk assessment of microplastics in surface waters of two public bathing beaches along the Northern Bay of Bengal." *Regional Studies in Marine Science* 83 (2025): 104067.
 10. Rahman, M. Mahbubur, Anupom Mondol, Md Kamrul Hasan, Md Shakhawoat Hossain, Md Fardin Ehsan, Nazmul Islam Tanvir, Mustafizur Rahman Naim, and M. Sarwar Jahan.

"Cellulose acetate from fast-growing hardwood–*Trema orientalis*: investigating acetylation parameters and viscosity." *International Wood Products Journal* 16, no. 1 (2025): 6-17.

11. Siddiqa, Shahrma, Sneha Gautam, Shamima Akther Eti, Fatima Khatun, Mohammad Mahbubur Rahman, H. M. Solayman, Azrina Abd Aziz, and Badiuzzaman Khan. "Characterization, distribution, and risk assessment of microplastic in fish and sediment from the longest river of Bangladesh." *Water Environment Research* 97, no. 2 (2025): e70029.
12. Akter, Rabeya, Md Monarul Islam, Md Wahidul Islam, Taslima Akter, Trisha Paul, Mohammad Mahbubur Rahman, Md Tushar Uddin, Shofiur Rahman, Abdullah N. Alodhayb, and Paris E. Georghiou. "Extraction procedure and theoretical studies of chitin from black soldier fly." *Journal of Polymer Research* 32, no. 2 (2025): 48.
13. Kalam, Md Abul, Salvin Mustakim, Mohammad Jellur Rahman, Md Tushar Uddin, Md Ashraful Alam, and Mohammad Mahbubur Rahman. "Bio-degradable smart nanocomposite fiber from *Moringa oleifera* fiber reinforced with safely functionalized carbon nanotubes." *AIP Advances* 15, no. 1 (2025).
14. Shibly, Mohammad Abul Hasan, Mohammad Mohsin Ul Hoque, Prosenjit Sen, Khandaker Akil Mahadi Ohi, Md Maruf Hossain, Md Masum Mia, Md Abdus Sabur, Mohammad Junaebur Rashid, and Mohammad Mahbubur Rahman. "Investigation of the physical, chemical and thermal properties of a novel lignocellulosic fiber extracted from the *Ravenala madagascariensis* leaf stalk." *RSC advances* 15, no. 31 (2025): 25150-25163.
15. Pk, Md Elius Hosen, Md Monarul Islam, Rabeya Akter, Fajilatun Nesa, Mohammad Mahbubur Rahman, Trisha Paul, Sonjida Mustafi et al. "Carboxymethyl Chitosan-based Biodegradable Films Preparation and Prospects for Food Preservation." *ChemistrySelect* 10, no. 1 (2025): e202404675.
16. Rahman, M. Mahbubur, Md Abu Bin Hasan Susan, Md Mominul Islam, and M. Sarwar Jahan. "Effect of pre-hydrolysis on the dissolution of hardwood pulp in double salt ionic liquid." *Nordic Pulp & Paper Research Journal* 39, no. 4 (2024): 709-718.
17. Shibly, Mohammad Abul Hasan, Md Ikramul Islam, Mohammad Mohsin Ul Hoque, Marat Sabit, Mohammad Mahbubur Rahman, Zahidul Islam, and Mohammad Junaebur Rashid. "*Hylocereus undatus* plant's stem agro-waste: A potential source of natural cellulosic fiber for polymer composites." *Sustainable Chemistry and Pharmacy* 41 (2024): 101692.
18. Rahman, M. Mahbubur, M. Sarwar Jahan, Md Mominul Islam, and Md Abu Bin Hasan Susan. "Dissolution of cellulose in imidazolium-based double salt ionic liquids." *International Journal of Biological Macromolecules* 267 (2024): 131331.
19. Hoque, Mohammad Amirul, AFM Mustafizur Rahman, Mohammad Mahbubur Rahman, Mohammad Nazrul Islam Bhuiyan, Shirin Akter Jahan, Md Aftab Ali Shaikh, and Mohammad Nurnabi. "Effect of successive recycling and reuse of acid liquor for the synthesis of graphene oxides with higher oxygen-to-carbon ratios." *Heliyon* 10, no. 6 (2024).

20. Shibly, Mohammad Abul Hasan, Md Ikramul Islam, Md Nur Hossain Rahat, Muhammad Maruf Billah, Mohammad Mahbubur Rahman, Muhammad Shahriar Bashar, Basit Abdul, and Hajer S. Alorfi. "Extraction and characterization of a novel cellulosic fiber derived from the bark of *Rosa hybrida* plant." *International Journal of Biological Macromolecules* 257 (2024): 128446.
21. M. F. Hasan, Z., Islam, M. S., Hassan, M., Khan, M. N. A., Rahman, M. M., & Rahman, Metal Organic Framework Derived Cu-Carbon Composite for the Effective Reduction of p-Nitrophenol. *Asian Journal of Chemistry*, 36(2), (2024): 481–488.
22. Hasan, Md Rashed, Mohammad Majedul Haque, Md Amirul Hoque, Shahin Sultana, Mohammad Mahbubur Rahman, Md Aftab Ali Shaikh, and Md Khabir Uddin Sarker. "Antioxidant activity study and GC-MS profiling of *Camellia sinensis* Linn." *Heliyon* 10, no. 1 (2024).
23. Nigar, Nigar Sultana, Mohammad Mahbubur Rahman, and Shamima Akther Eti. "Pollution loads identification and ecological risk assessment of heavy metals in Patuakhali coastal sediment of Bangladesh." *Bangladesh Journal of Scientific and Industrial Research* 58, no. 3 (2023): 143-154.
24. Eti, Shamima Akther, Muhammad Saiful Islam, Jahid Hasan Shourove, Badhan Saha, Swapan Kumer Ray, Shahin Sultana, Md Aftab Ali Shaikh, and Mohammad Mahbubur Rahman. "Assessment of heavy metals migrated from food contact plastic packaging: Bangladesh perspective." *Heliyon* 9, no. 9 (2023).
25. Khan, Md Badiuzzaman, Sabina Yeasmin Urmy, Shamsunnahar Setu, Abeer Hossain Kanta, Sneha Gautam, Shamima Akther Eti, Mohammad Mahbubur Rahman, Niger Sultana, Shahed Mahmud, and Md Abdul Baten. "Abundance, distribution and composition of microplastics in sediment and fish species from an Urban River of Bangladesh." *Science of the Total Environment* 885 (2023): 163876.
26. Jahan, M. Sarwar, and M. Mahbubur Rahman. "Production of Nanomaterials from Forest Resources." *Materials Research Foundations* 148 (2023).
27. Islam, Md Monarul, Rashedul Islam, SM Mahmudul Hassan, Md Rezaul Karim, Mohammad Mahbubur Rahman, Shofiur Rahman, Md Nur Hossain, Dipa Islam, Md Aftab Ali Shaikh, and Paris E. Georghiou. "Carboxymethyl chitin and chitosan derivatives: synthesis, characterization and antibacterial activity." *Carbohydrate Polymer Technologies and Applications* 5 (2023): 100283.
28. Rahman, M. Mahbubur, MD NURUL ANWAR KHAN, MD KAMRUL HASAN, Mahbub Alam, M. Mostafizur Rahman, M. Shahriar Bashar, MD AFTAB ALI SHAIKH, and M. Sarwar Jahan. "Effects of ball milling and enzyme treatment on cellulose acetylation." *Cell Chem Technol* 57 (2023): 717-725.
29. Rahman, M. Mahbubur, Mahbub Alam, M. Mostafizur Rahman, Md Abu Bin Hasan Susan, Md Aftab Ali Shaikh, Jannatun Nayeem, and M. Sarwar Jahan. "A novel approach in increasing carboxymethylation reaction of cellulose." *Carbohydrate Polymer Technologies and Applications* 4 (2022): 100236.

30. Hasanah, Uswatun, Muhammed Shah Miran, Mohammad Mahbubur Rahman, and Md Mominul Islam. "Simultaneous reductions of production loss and environmental burden through the treatment of loose leather with non-toxic manganese dioxide nanoparticles." *Journal of Cleaner Production* 318 (2021): 128541.
31. Ara, Nargish Jahan, Mohammad Farhadur Rahman, Zubair Hasan, Md Shofiqul Islam, and Mohammad Mahbubur Rahman. "Development of the N-Doped Cu-Carbon Composite as a Novel Catalyst for the Removal Reactive Black 5." *Open Journal of Applied Sciences* 10, no. 7 (2020): 432-443.
32. Hossain, M. A., M. Elias, M. M. Rahman, M. M. Rahaman, M. S. Ali, and M. A. Razzak. "Multi-phenyl structured aromatic hydrocarbon polymer." *Bangladesh Journal of Scientific and Industrial Research* 55, no. 2 (2020): 139-146.
33. Antora, S. A., M. N. Hossain, M. M. Rahman, M. A. Alim, and M. Kamruzzaman. "Detection of adulteration in edible oil using FT-IR spectroscopy and machine learning." *International Journal of Biochemistry Research & Review* 26, no. 1 (2019): 1-14.
34. Das, Avizit, Mohammad Imtiazur Rahman, Ahlan Sabah Ferdous, Al Amin, Mohammad Mahbubur Rahman, Nilufar Nahar, Md Aftab Uddin, Mohammad Riazul Islam, and Haseena Khan. "An endophytic Basidiomycete, *Grammothele lineata*, isolated from *Corchorus olitorius*, produces paclitaxel that shows cytotoxicity." *PLoS One* 12, no. 6 (2017): e0178612.
35. Rahman, M. Mahbubur, Md Rakibul Qadir, A. J. M. T. Neger, and A. S. W. Kurny. "Studies on the preparation of zinc oxide from galvanizing plant waste." *American Journal of Materials Engineering and Technology* 1, no. 4 (2013): 59-64.
36. Rahman, M. M., A. J. M. T. Neger, A. Gafur, and A. S. W. Kurny. "Studies on the preparation of lead (II) chloride from galvanizing plant wastes." *Bangladesh Journal of Scientific and Industrial Research* 47, no. 4 (2012): 415-420.
37. Hoque, M. Amirul, A. Nakayama, H. P. Nur, S. K. Raya, M. M. Rahman, and S. Khabir Uddin. "Synthesis and characterization of copoly (L-lactic acid-caprolactone) and its stereo-effect with poly D-lactic acid and biodegradability." *Bangladesh Journal of Scientific and Industrial Research* 47, no. 2 (2012): 203-210.
38. Alam, A. K. M. M., Quazi TH Shubhra, Gazi Al-Imran, Sanjoy Barai, M. R. Islam, and M. Mahbubur Rahman. "Preparation and characterization of natural silk fiber-reinforced polypropylene and synthetic E-glass fiber-reinforced polypropylene composites: a comparative study." *Journal of composite materials* 45, no. 22 (2011): 2301-2308.
39. Islam, Md Monarul, Shah Md Masum, M. Mahbubur Rahman, Md Ashraful Islam Molla, A. A. Shaikh, and S. K. Roy. "Preparation of chitosan from shrimp shell and investigation of its properties." *International Journal of Basic & Applied Sciences* 11, no. 1 (2011): 116-130.
40. Islam, M. M., S. M. Masum, M. M. Rahman, and A. A. Shaikh. "Preparation of glucosamine hydrochloride from indigenous shrimp processing waste." *Bangladesh journal of scientific and industrial research* 46, no. 3 (2011): 375-378.

Conference Presentations

1. China International Paper Technology Exhibition (CIPTTE 2025) and 2025 International Paper Technical Conference, Duration: 13 – 15 August, 2025
2. Participating in the 15th HOPE Meeting with Nobel Laureates, Kyoto, Japan, 24 february- 2 March 2024
3. 39 th Annual Conference of Bangladesh Chemical society (BCC2018)
4. 22nd Bangladesh Science Conference (BAAS), Abstract published, 2012
5. 35th Annual Conference of Bangladesh Chemical Society(BCC2012), Abstract published and presented a paper, 2012

Thesis Supervisions

- MS Thesis: “Eco-Friendly Hybrid Supercapacitor Electrode Development Using Cellulose Nanocrystals (CNCs) and Reduced Graphene Oxide, Department of Chemistry”, Dhaka College Affiliated University of Dhaka, Bangladesh (2025)
- MS Thesis: “Microplastic Quantification and Identification in Water, Sediment and Fish Species of Payra River, Bangladesh. Department of Fisheries, University of Dhaka, Dhaka, Bangladesh (2025).
- MS Thesis: “Synthesis and Characterization of Plasma- Treated Jute Biomass Cellulose-Derived Carboxymethyl Cellulose (CMC) and CMC based Silver Nanocomposite Department of Chemistry”, University of Dhaka, Dhaka-1000, Bangladesh (2024)
- MS Thesis: “Comparison of Abundance and Spatial Distribution of Microplastic in water Sediment and fish along bathe Revering- Marine Continuum in Bangladesh with the Assessment of Potential Ecological Risk.”. Department of Fisheries, University of Dhaka, Dhaka, Bangladesh (2024).
- MS Thesis: “Synthesis of Cellulose Acetate from Hardwood Kraft Pulp and Its Rheological Analysis. Department of Chemistry”, University of Dhaka, Dhaka-1000, Bangladesh (2023)
- MS Thesis: “Approach to the Synthesis of Highly Substituted Cellulose Acetate, Department of Chemistry”, University of Dhaka, Dhaka-1000, Bangladesh (2022).

Industrial Process Developed

- Production of Food, Drug & Cosmetic Grade Water Soluble Curcumin Pigments. Ref:39.373.037.04.00.197.2012/473 dated:29.01.2013.
- Production of Rubber Curing Agent incorporating Natural Rubber Latex in Sulfur powder for the use in Natural Rubber based products Ref:39.373.037.01.00.209.2013/247, dated: 03.03.2014

- Production of Synthetic Rubber based Rubber Curing Agent containing High percentage of Sulfur powder for the use in Synthetic Rubber based products
Ref:39.373.037.01.00.232.2013/248 dated:03.03.2014
- A Process for the production of Food, Drug & Cosmetic Grade Water Soluble Curcumin Pigments. Ref: Patent No. 1/2013/3733, dated 29/09/2014

- **Professional Memberships**

- Life member of BCS, BAAS, DUCAA and DUAA.

Professional Trainings

1. Training course on “Turnitin iThenticate Software” BCSIR, Dhaka, September 11, 2025.
2. International Training Workshop on Waste Paper Recycling Technology, Beijing, Zhejiang and Shanghai; China, 1 – 15 August, 2025
3. Training workshop on pulping and papermaking technology of non-wood fiber”, China national pulp and paper research institute (CNPPRI), 12-31 August 2018.
4. Training on UPLC-MS-MS System: Techniques & Software, Agilent Technologies, Germany,23-27 August, 2017
5. Training Course on Understanding & Evaluation Measurement Uncertainty, BAB, Motijeel, Dhaka, Bangladesh,27-28 September,2016
6. 1st Special Foundation Training Course, BPATC, Savar, Dhaka, Bangladesh, 12.07.2015-09.09.2015
7. Training on “Centrifugal Partition Chromatography”, F&PRD, BCSIR Dhaka Laboratories,23-25 March, 2015
8. Training on TG-GC-MS System, BCSIR Labs, Dhaka, 26.10.2015-03.11.2015
9. Training on FT-MIR/NIR Spectrometer, BCSIR Labs, Dhaka, 23-25 May 2015
10. Training on Size Exclusion Chromatography, BCSIR Labs, Dhaka, 12-14 May 2015
11. Training on Operating system and maintenance of “Gas Chromatography & Gas Chromatography-Mass spectrometer, INARS, BCSIR,18-20 Februar,2014
12. Training on Operating system and maintenance of Liquid Chromatography Mass Spectrometer (LCMS), BCSIR Laboratories, Dhaka, 8-9 February, 2014
13. Training on Management Skills for Executives, NAPD, Nilkhet, Dhaka.3-7 November, 13
14. Training on Operating system and maintenance of LC-MS-MS, IFST, BCSIR ,7-9 May 2012
15. Training on “Operating system and maintenance of Universal Testing Machine (UTM)”, PP&PDC, BCSIR, 27-28 June 2012
16. Training on “Operating system and maintenance of Energy Dispersive X-Ray Fluorescence Spectroscopy (ED-XRF)”, IFST, BCSIR, 18-20 November 2012

(Dr. Mohammad Mahbubur Rahman)