Curricular Vitae

DR. LAKHYA JYOTI BORTHAKUR, M.Sc., Ph.D.
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Summary

Proactive lecturer and researcher over 17+ years of experience in Chemistry. Involved in teaching physical chemistry and spectroscopy both at undergraduate and postgraduate levels. Active researcher in the field of nanoscience and technology. Supervised 01 Ph.D. Thesis, 25 M.Sc. dissertations and currently guiding 5 Ph.D. Students. Co-authored 3 books, Editor of one peer reviewed Journal, supervised 3 research projects and published good number of research articles in peer-reviewed international Journals.

Education

2011 Ph.D. in Chemical Sciences from Tezpur University, Assam
Thesis Title: "Development of Core-shell latex Particles by Emulsion Polymerization" Thesis Supervisor: Prof. S. K. Dolui

2004 M.Sc. in Chemistry (Physical Chemistry as Special Paper) from Gauhati University, Assam,

2002 B.Sc. with Chemistry Major from B.Borooah College, Guwahati, Assam (Affiliated to Gauhati University)

Professional Appointments

24-08-2005 to 11-09-2007	Junior Research Fellow Deptt. Of Chemical Sciences, Tezpur University, Assam
12-09-2007 to 31-03-2024	Assistant Professor Department of Chemistry Nowgong College (Autonomous), Assam
01-04-2024 till date	Associate Professor Department of Chemistry Nowgong College (Autonomous), Assam

Research Interest

- Photocatalysis
- Electrochemical energy storage
- Electrochemical sensors and biosensors
- Wastewater treatment

Recognition/Award

- Focus Area Science Technology Summer Fellowship-2023 (FAST-2023, Teacher Category) awarded by Indian National Science Academy (INSA). In this fellowship have worked at Central Electrochemical Research Institute (CSIR-CECRI) for a period of 8 weeks from 1st June, 2023 to 26th July, 2023.
- SHRI ANUPAM SINHA BEST CHEMISTRY TEACHER AWARD -2023 by Association of Chemistry Teachers, India
- Late Dulal Chandra Goswami Memorial Research Award, 2022 offered by DCGMCT, Nowgong College (Autonomous) for excellence in Research.
- Awarded best paper in International Seminar On 'Frontiers in Polymer Science and Technology' organized by Prof. Sukumar Maiti Polymer Award Foundation, Kolkata, India on 1st to 3rd November, 2007
- Qualified UGC-CSIR NET (LS), 2004, December

Selected Journal Publications

1. Bidyutjyoti Dutta, Madhabi Konwar, **Lakhya jyoti Borthakur**, and Diganta Sarma. "A binary mixture of ionic liquids as a sustainable electrocatalyst for oxygen evolution reaction." *Journal of Molecular Liquids* (2024). https://doi.org/10.1016/j.molliq.2024.126385
2. Madhabi Konwar, **Lakhya Jyoti Borthakur** "Synergistic effect of SGO/Nickel cobalt sulfide nanocomposite on Ni-foam for supercapacitor performance with widened potential windows − A microwave-assisted synthesis" Journal of Industrial and Engineering Chemistry (2024). https://doi.org/10.1016/j.jiec.2024.10.037
3. Masum Das, Madhabi Konwar, Utpal Sadhonider, **Lakhya Jyoti Borthakur**, Utpal J. Mahanta, Lakshi Saikia, Madhuryya Deka" Scaling the ionic conductivity and electrochemical properties of bio-based gel polymer electrolytes reinforced with Al_2O_3 nanofibers for energy storage applications" Polymer Bulletin (2024). https://doi.org/10.1007/s00289-024-05542-0
4. Shyamalee Patar, Rishi Mittal, Farishta Yasmin, Balin Kumar Bhuyan, and **Lakhya Jyoti Borthakur.** "Photocatalytic degradation of antibiotics by N-doped carbon nanoflakes-nickel ferrite composite derived from algal biomass." *Chemosphere* (2024). https://doi.org/10.1016/j.chemosphere.2024.142908
5. Shyamalee Patar, Rishi Mittal, Balin Kumar Bhuyan, and **Lakhya Jyoti Borthakur**. "Fabrication of CoFe2O4/sulphonated graphene oxide antibacterial nanohybrid and evaluation of its enhanced photocatalytic activity, mechanism and pathway of degradation of textile

dyes." *Journal of Water Process Engineering* (2024). https://doi.org/10.1016/j.jwpe.2024.104795

6. Madhabi Konwar, Rana Sanjay Kumar Singh, and **Lakhya Jyoti Borthakur**. "Zinc Cobalt Sulfide/Reduced Graphene Oxide Nanocomposite for High-Performance Asymmetric Supercapacitor: A Microwave-Assisted Synthesis." *Energy Technology* (2024). https://doi.org/10.1002/ente.202301524
7. Shyamalee Patar, Rishi Mittal, Ananya Dutta, Balin Kumar Bhuyan, and **Lakhya Jyoti Borthakur**. "Algae derived N-doped mesoporous carbon nanoflakes fabricated with nickel ferrite for photocatalytic removal of Congo Red and Rhodamine B dyes." *Surfaces and Interfaces* (2024): 104710.https://doi.org/10.1016/j.surfin.2024.104710
8. Madhuryya Deka, Yashibenla Longkumar, Bitupan Boruah, Himadri Sarmah, Madhabi Konwar and **Lakhya Jyoti Borthakur. "** Borax cross-linked guar gum hydrogel-based self-healing polymer electrolytes filled with ceramic nanofibers towards high-performance green energy storage applications." Reactive and Functional Polymers (2024).https://doi.org/10.1016/j.reactfunctpolym.2023.105822
9. Bidyutjyoti Dutta, Priyanuj Krishnann Hazarika, Pranjal Saikia, Surajit Konwer, **Lakhyajyoti Borthakur,** Diganta Sarma. "[DDQM][TFSI]: a room temperature ionic liquid as an active electrode material for supercapacitor devices and a catalyst for rapid synthesis of 4-aryl-NH-1, 2, 3-triazoles under microwave irradiation." New Journal of Chemistry, (2023). https://doi.org/10.1039/D3NJ00862B
10. Baishali Mahanta, Hasan Al Mamun, Rana Sanjay Kumar Singh, and **Lakhya Jyoti Borthakur**. "A sulfonated graphene supported nano copper MoS 2 network for non-enzymatic simultaneous sensing of dopamine and serotonin." New Journal of Chemistry 2023. **https://doi.org/10.1039/D3NJ03404F**
11. Shyamalee Patar, Surajit Konwar, Tikendrajit Chetia, Balin Bhuyan, **Lakhya Jyoti Borthakur**. "Photocatalytic Nanojunction of Cobalt Ferrite Anchored Sulfonated Graphene for Reduction of Nitrophenols." ACS Applied Nano Materials, (2023).https://doi.org/10.1021/acsanm.3c00162
12. Baishali Mahanta, Hasan Al Mamun, Madhabi Konwar, Shyamalee Patar, Pranjal Saikia, **Lakhya Jyoti Borthakur**. "Non-Enzymatic Electrochemical Biosensor for Dopamine Detection Using MoS_2/rGO/Ag Nanostructure." Chemistry Select (2023). **https://doi.org/10.1002/slct.202205030**
13. Madhabi Konwar, Baishali Mahanta, Shyamalee Patar, Pranjal Saikia, Ankur Kanti Guha, and **Lakhya Jyoti Borthakur**. "A Reduced-Graphene-Oxide Entrapped $CuCo_2S_4$ Nano-Array for

High-performance Supercapacitor Electrode." Chemistry Select (2022). **https://doi.org/10.1002/slct.202203585**

14. Pranjal Saikia, Madhabi Konwar, Shyamalee Patar, Baishali Mahanta, Pranjit Barman, and **Lakhya Jyoti Borthakur**. "Electrochemical Performance of rGO/AFCNT Composite and Fabrication of Supercapacitor Electrode." Materials Today Communications (2022). https://doi.org/10.1016/j.mtcomm.2022.104657
15. Shyamalee Patar, Balin Kumar Bhuyan, Madhabi Konwar, Baishali Mahanta, Pranjal Saikia, Ankur Kanti Guha, and **Lakhya Jyoti Borthakur**. "Novel Zinc Ferrite Anchored Graphene Oxide Magnetic Nanocomposite for Photocatalytic Degradation of Textile Dyes." ChemistrySelect (2022). **https://doi.org/10.1002/slct.202201936**
16. Pranjal Saikia, Pranjit Barman, and **Lakhya Jyoti Borthakur**. "Nanocomposites of Carbon Nanotubes for Electrochemical Energy Storage Applications." In *Nanostructured Materials for Supercapacitors*. Springer, Cham, (2022). https://doi.org/10.1007/978-3-030-99302-3_12
17. Pranjal Saikia, Kaushik Dutta, Ankur kanti Guha, S.K. Dolui, Pranjit Barman, **Lakhya Jyoti Borthakur,** 'High Performance aqueous electrolyte-based supercapacitor of carboxylic acid functionalized carbon-nanotubes and graphene nano composite' Materials Chemistry and Physics, (2021).https://doi.org/10.1016/j.matchemphys.2020.123786
18. S. K. Dolui, D. Das, **L. Borthakur**, B. C. Nath, B. J. Saikia, Kiran Mohan, 'Designing of hierarchical NiO/PAni-MWCNT core-shell nanocomposites for high-performance super capacitor electrode' RSC Advances, (2016). DOI: 10.1039/C6RA01777K
19. Dhaneswar Das, Parag Choudhury, **Lakhyajyoti Borthakur**, Bhaskarjyoti Gogoi, Alak Kumar Buragohain, Swapan Kumar Dolui 'Synthesis and characterization of SiO2/polyaniline/Ag core– shell particles and studies of their electrical and hemolytic properties: multifunctional core–shell particles' RSC Advances, (2015). DOI: 10.1039/C4RA14444A
20. Dhaneswar Das, Parag Choudhury, **Lakhyajyoti Borthakur**, Isha Ruhulla Kamrupi, Ujjal Gogoi, Swapan Kumar Dolui 'Methanol vapor sensor based on poly (styrene-co-butylacrylate)/polypyrrole -EG core–shell nanocomposites' Sensors and Actuator B: Chemical**,** (2014). https://doi.org/10.1016/j.snb.2014.03.100
21. S. Konwer**, L.J. Borthakur,** S.K.Dolui Synthesis of graphite incorporated core-shell composite of styrene-methylacrylate/polyaniline by surfactant free mini-emulsion polymerization and evaluation of their electrical property' J. Polym Res, (2012). https://doi.org/10.1007/s10854-011-0503-x
22. **L. J. Borthakur**, S. Sharma, S.K. Dolui 'Studies on Ag/Polypyrrole composite deposited on the surface of styrene-methyl acrylate copolymer microparticles and their electrical and electrochemical properties, J Mater Sci: Mater Electron, (2011).

https://doi.org/10.1007/s10854-010-0242-4

23. **L. J. Borthakur**, S. Konwer, R. Das, S. K. Dolui 'Preparation of conducting composite particles of styrene– methyl acrylate copolymer as the core and graphite-incorporated polypyrrole as the shell by surfactant-free mini emulsion polymerization' J. Polym Res, (2011). https://doi.org/10.1007/s10965-010-9524-z.

24. **L. J. Borthakur**, D. Das, S.K. Dolui 'Development of core–shell nano composite of poly (styrene-co- methyl acrylate) and bentonite clay by ultrasonic assisted mini- emulsion polymerization' Materials Chemistry and Physics,(2010). https://doi.org/10.1016/j.matchemphys.2010.08.055
25. **L. J. Borthakur**, T. Jana, S.K. Dolui, Preparation of core–shell latex particles by emulsion co-polymerization of styrene and butylacrylate, and evaluation of their pigment properties in emulsion paints, J. Coat. Technol Res., (2010). https://doi.org/10.1007/s11998-010-9265-2
26. R. kamrupi, **L. J. Borthakur**, S.K. Dolui, "Emulsion Polymerization of Styrene in Supercritical Carbon dioxide (sc-CO_2) Stabilized with (Trifluoromethyl) Undecafluorocyclohexane (C7F14)", *J. Polym. Mater* (2010). ISSN: *0970-0838*
27. Ankur Gogoi, **Lakhya J. Borthakur**, Amarjyoti Choudhury, George A. Stanciu, and Gazi A. Ahmed. "Detector array incorporated optical scattering instrument for nephelometric measurements on small particles." *Measurement Science and Technology* (2009). **DOI** 10.1088/0957-0233/20/9/095901

Books Published

1. Lakhya Jyoti Borthakur, Swapan Kumar Dolui 'Development of core-shell latex Particles by Emulsion Polymerization Various method of synthesis and potential applications (ISBN: 978-3- 8484-8139-2),' Lambert Academic Publishers, Germany, 2012
2. Lakhya Jyoti Borthakur, Pallabi Goswami, N.K. Brahma 'Chemistry for Degree Students, Semester-I' , Assam Book Depot, 2019
3. Lakhya Jyoti Borthakur, Pallabi Goswami, N.K. Brahma 'Chemistry for Degree Students, Semester-II', Assam Book Depot, 2020

Research Project Completed

1. Completed UGC sponsored Minor Research Project "Development of Core-shell Polymeric Particles by Emulsion Polymerization" of worth Rs. 1,50,000/ and 1 year 6 months duration in 2010.
2. Completed UGC sponsored Minor Research Project "Designing of toxic gas sensors based on core-shell composites of conducting polymers" of worth Rs. 2, 35,000/ and 2 years duration.

3. Completed SERB sponsored Major Research Project "Development of novel ternary composite

of graphene for supercapacitor electrode" of worth Rs. 38.75 lakh and 3 years duration.

Articles Published in Conference Proceedings

1. Saikia, P, Borthakur, L.J. (2019) 'Graphene and Its Composite for Capacitive Energy Storage Device', Proceedings of Multidisciplinary International Seminar on "A Perspective of Global Reseach Process: Present Scenario & Future Challenges" organized by Manipur University, Imphal on 19th & 20th January, 2019
2. Saikia, P., Barhoi, A., & Borthakur, L. J. (2018) 'An eco-friendly approach of synthesis and characterization of reduced Graphene oxide from sugarcane bagasse", Proceedings of National Seminar on Bioresource for Sustaining life and Livelihood in North-East India organized by Nowgong College on 4th & 5th October, 2018.
3. Borthakur L.J. (2018) 'The Role of Literature In Spreading Knowledge About Science and It's Social Context', Proceedings of the National Seminar on "Co-Production of Science & Social Order: A Social Science Perspective on Gifts of Science to Society for Overall Development" held on 17th & 18th August, 2018 at Nowgong College.
4. Borthakur L.J. (2014) 'Effect of Electronic Waste Generated from Mobile Handsets on the Environment and Human Health' Proceedings of the National Seminar on 'Impact of Cell-Phone Radiation on Environment' on 17th & 18th October, 2014 at Dhing College, Nagaon, Assam.

Popular Articles of Chemistry and Science Published in Assamese Magazines

1. *'Upaja Matir Gondha'* an article published in the Assamese trimonthly magazine '*Samikhyan'* (Issue: July to September, 2023)
2. '*Kritim Budhimatta aru Manuhor Vabishyat'*, an article published in the Assamese trimonthly magazine '*Samikhyan'* (Issue: April to June, 2023)
3. *'Agni Prajalitong Bonde'*, an article published in the Assamese monthly magazine for teen agers**,** 'Bara- Uthara', (Issue: April, 2022)
4. *'Rong Kiniba Kone'* an article published in the Assamese monthly magazine for teen agers**,** *'Bara- Uthara'*, (Issue: March, 2022)
5. *'Jonakir Jilmil'* an article published in the Assamese monthly magazine for teen agers**,** *'Bara-Uthara'*, (Issue: January, 2022)

6. *'Plastic or Itihas' an article published in the Assamese monthly magazine for teen agers***,** *'Bara-Uthara', (Issue: December, 2021)*
7. *'Samajik Darwinism:Baigyanik Matabadr Apaproyag '* an article published in the Assamese monthly magazine**,** *'Satsori',* (Issue: December, 2021) ISSN: 2319-8893
8. *'Jui RandhanKala aru Budhimatta' an article published in the Assamese monthly magazine***,** *'Satsori',* (Issue: June, 2021) ISSN: 2319-8893
9. *'Budhimattar Vikashat Juir Bhumika' an* article published in the Assamese trimonthly magazine '*Samikhyan'* (Issue: January to March, 2021)
10. '*BikiranBihin Prithibir Kalpana'*, an article published in the bimonthly popular science magazine of Assam Science Society, (Issue: February – March, 2020) ISSN: 2319-3085
11. *'Alzeimer Rog: Bismitir Rahasya Sandhan'* an article published in the Assamese Fortnightly magazine, *'Prantik'*, (Issue: 1st – 15th December, 2019), ISSN: 0971-5932
12. *'Darwin e Bhangiba Nowara Sathar',* an article published in the Assamese Fortnightly magazine, *'Prantik'*, (Issue: 1st – 15th November, 2019), ISSN: 0971-5932
13. *'Bharatiya Vigyan Congress: Bhuwa Vigyanar Rahghora',* an article published in the Assamese Fortnightly magazine, *'Prantik'*, (Issue: 16th – 31st March, 2019), ISSN: 0971-5932
14. ***'Sulai Mod Tragedy: Aror Vigyan totha Rajneeti', an*** article published in the Assamese trimonthly magazine '*Samikhyan'* (Issue: January to March, 2019)
15. '*Jibon Rahaishyar Rasayanik Bisleshan'* an article published in the Assamese Fortnightly magazine *'Prantik'*, (Issue: 16th -31st January, 2019), ISSN: 0971-5932
16. *'Mahekiya Raktar Pora Jibondayini Stem kosh'* an article published in the Assamese Fortnightly magazine, *'Prantik'*, (Issue: 1st – 15th January, 2019), ISSN: 0971-5932
17. *'Bayumandalat Punar Choloro-fluoro Carbon'* an article published in the Assamese Fortnightly magazine *'Prantik'*, (Issue: 16th -30th November, 2018), ISSN: 0971-5932
18. *'Eta Sathik Prasnar Sandhanat',* an article published in the Assamese Fortnightly magazine *'Prantik'*, (Issue: 16th -30th September, 2018), ISSN: 0971-5932

Personal Details

Father's Name: Lt. Padma Borthakur
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