Dr. Titash Mondal
Rubber Technology Center, Indian Institute of Technology Kharagpur
Kharagpur, West Bengal, India 721302
E-Mail: titash@rtc.iitkgp.ac.in; titash786@gmail.com
Date of Birth: February 22, 1986
Gender: Male

Professional Summary:

Highly accomplished and motivated researcher with a Ph.D. in Chemistry, specializing in Rubber Technology and Nanocomposites. Demonstrated expertise in developing innovative materials and technologies. Proven track record of successful research publications and patents. Seeking opportunities to contribute expertise and leadership as a researcher or educator in the field of Rubber Technology.

Education:

- Ph.D., Chemistry, Jointly from IIT Patna and University of Houston, USA, 2015
  (Thesis Title: Synthesis and Characterization of Functionalized Expanded Graphite and Graphene, Guide's Name: Professor Anil K. Bhowmick & Professor Ramanan Krishnamoorti)
- M.Tech, Rubber Technology, IIT Kharagpur, 2011
- M.Sc, Organic Chemistry, Ramakrishna Mission Residential College, Narendrapur University of Calcutta, 2009
- B.Sc (H), Chemistry, Scottish Church College, University of Calcutta, 2007

Work Experience:

1. **Assistant Professor Grade I, IIT Kharagpur**

   March 04, 2020 - Till Date

2. **Research Scientist, Momentive Performance Materials**

   July 01, 2018 - February 28, 2020

3. **Advanced Scientist, Momentive Performance Materials**

   October 16, 2016 - June 30, 2018

4. **Senior Project Officer, IIT Kharagpur**

   October 01, 2015 - October 15, 2016

5. **Research Associate, IIT Kharagpur**

   October 16, 2014 - September 30, 2015

Editorial Responsibilities:

1. Journal: Research Directions: Bioelectronics
   Publisher: Cambridge University Press, UK
   Role: Editorial Board Member
   Year: 2023- till date

2. Journal: Frontiers in Polymer Chemistry
   Publisher: Frontiers, USA
   Role: Review Editor
   Year: 2022- till date

Publications:

1. Cross-talk Signal Free Recyclable Thermoplastic Polyurethane/Graphene Based Strain and Pressure Sensor for Monitoring Human Motions by Haridas C P A, Sharma S., Naskar K., **Mondal T.* ACS Applied Materials and Interfaces** - (2023) https://doi.org/10.1021/acsami.3c01364 (*Featured in Nature India, Nature as a research highlight, https://www.nature.com/articles/d44151-023-00045-9*)

2. Thermally conductive durable strain sensors for next-generation intelligent tires from natural rubber nanocomposites by Surya K P, Sharma S., **Mondal T.***, Naskar K.* , Bhowmick A.K.* **ACS Rubber Chemistry and Technology**- (2023) https://doi.org/10.5254/rct.23.76951

3. Printable Carbon Nanotube-Liquid Elastomer-Based Multifunctional Adhesive Sensors for Monitoring Physiological Parameters by Selvan T M., Sharma S. , Naskar S. , Mondal S. , Kaushal M. , **Mondal T.*ACS Applied Materials and Interfaces** - 14 45921–45933 (2022)

4. Printable Graphene-Sustainable Elastomer-Based Cross Talk Free Sensor for Point of Care Diagnostics by Sharma S., Selvan T M. , Naskar S. , Mondal S. , Adhya P. , Mukhopadhyay T. , **Mondal T.*ACS Applied Materials and Interfaces** 14 57265-57280 (2022)

5. Synthesis of Polyetheramine-Grafted Epoxidized Natural Rubber and Its Role in Humidity Adhesive Sensors by Guchait A., Ganguly D., Sengupta C., Chattopadhyay S., **Mondal T.* ACS Sustainable Chemistry and Engineering** 10 16780-16792 (2022)

6. Influence of Nanofillers on Adhesion Properties of Polymeric Composites by Guchait, A., Saxena, A., Chattopadhyay, S., **Mondal T.* ACS Omega**, https://doi.org/10.1021/acsomega.1c05448 , 2022

7. Radiation curable polysiloxane: synthesis to applications by Selvan M., **Mondal T.*Soft Matter** - 17, 6284- (2021)

8. Controlled Methodology for Development of a Polydimethylsiloxane Polytetrafluoroethylene-Based Composite for Enhanced Chemical Resistance: A Structure Property Relationship Study by Kaur B., Kumar S. , **Mondal T.***, Phukan M. , Saxena A. , Dalavoy T. , Bhowmick A. K., Bhat S.* **ACS Omega** - 5, 22482–(2020)

9. Study of reinforcement mechanism and structural elucidation of expanded graphite carbon black hybrid filler SBR nanocomposites through comprehensive analysis of mechanical properties and small angle X ray data by Roy A., **Mondal T.**, Kar S. , Naskar K. , Ghosal R. , Mukhopadhyay R. , Bhowmick A. K. **Journal of Applied Polymer Science** 138 49093- (2020)

10. Structure property correlation of silicone hydrogels based on 3 [tris(trimethylsilyloxy)silyl]propyl methacrylate monomer by Sharma A., Bhat S.* , Dasgupta D. , Samantara L. , Kalyanachakravarthi K. , Manchanda B. , Shah C. , Saxena A. , Choudhury V. , **Mondal T.*Journal of Applied Polymer Science** 137 49198-(2020)

11. Expanded graphite as an agent towards controlling the dispersion of carbon black in poly (styrene co-butadiene) matrix: An effective strategy towards the development of high performance

multifunctional composite by **Mondal T.**, Bhowmick A. K., Ghosal R. , Mukhopadhyay R. **Polymer** 146 31-41 (2018)

12. Ionic liquid modification of graphene oxide and its role towards controlling the porosity, and mechanical robustness of polyurethane foam by **Mondal T.*,** Basak S. , Bhowmick A. K. **Polymer** 127 106-118 (2017)

13. Graphene-based elastomer nanocomposites: functionalization techniques, morphology, and physical properties by **Mondal T.**, Bhowmick A. K., Ghosal R. , Mukhopadhyay R. **Advances in Polymer Science** 267-318 (2016)

14. Graphene Nanocomposites with High Molecular Weight Poly(-caprolactone) Grafts: Controlled Synthesis and Accelerated Crystallization by **Mondal T.**, Ashkar R. , Butler P. , Bhowmick A. K., Krishnamoorti R. **ACS Macro Letters** 278-282 (2016) Page 4

15. Impeded repair of abasic site damaged lesions in DNA adsorbed over functionalized multiwalled carbon nanotube and graphene oxide by Kumari R., **Mondal T.**, Bhowmick A. K., Das P. **Mutation Research/Genetic Toxicology and Environmental Mutagenesis** 803-804 39-46 (2016)

16. Unique method to improve the thermal properties of bisphenol A tetraacrylate by graphite oxide induced space confinement by **Mondal T.***, Chandra V. , Bhowmick A. K. **RSC Advances** 6 104483-104490 (2016)

17. Controlled Synthesis of Nitrogen Doped Graphene from a Heteroatom Polymer and Its Mechanism of Formation by **Mondal T.**, Bhowmick A. K., Krishnamoorti R. **Chemistry of Materials** 27 716-725 (2015)

18. Butyl lithium assisted direct grafting of polyoligomeric silsesquioxane onto graphene by **Mondal T.**, Bhowmick A. K., Krishnamoorti R. **RSC Advances** 4 8649-8656 (2014)

19. Conducting Instant Adhesives by Grafting of Silane Polymer onto Expanded Graphite by **Mondal T.**, Bhowmick A. K., Krishnamoorti R. **ACS Applied Materials and Interfaces** 6 160197-16105 (2014)

20. Stress Generation and Tailoring of Electronic Properties of Expanded Graphite by Click Chemistry by **Mondal T.**, Bhowmick A. K., Krishnamoorti R. **ACS Applied Materials and Interfaces** 7244-7253 (2014)

21. Synthesis and characterization of bi-functionalized graphene and expanded graphite using n-butyl lithium and their use for efficient water soluble dye adsorption by **Mondal T.**, Bhowmick A. K., Krishnamoorti R. **Journal of Materials Chemistry A** 1 8144-8153 (2013)

22. 2-Methyl oxazoline-grafted carbon nanofibers: preparation, characterization and their role in elastomeric actuators by **Mondal T.**, Bhowmick A. K. **Journal of Materials Science** 47 4178-4186 (2012)

23. Chlorophenyl pendant decorated graphene sheet as a potential antimicrobial agent: synthesis and characterization by **Mondal T.**, Bhowmick A. K., Krishnamoorti R. **Journal of Materials Chemistry** 22 22481-22487 (2012)

24. Poly (l-lactide-co- caprolactone) microspheres laden with bioactive glass-ceramic and alendronate sodium as bone regenerative scaffolds by **Mondal T.**, Sunny M. C., Khastgir D., Varma H. P. R. **Materials Science and Engineering C** 697-706 (2012)

Patents:

1. Title: Curable silicone-based compositions and applications thereof
   Inventors: **Titash Mondal**, Murali MG, Shreedhar Bhat, Haigang Kang
   Patent Number: US20220073746A1

2. Title: Curable silicone-based compositions and applications thereof
   Inventors: **Titash Mondal**, Murali MG, Shreedhar Bhat
   Patent Number: US20220056270A1

3. Title: Curable silicone-based compositions and applications thereof
   Inventors: **Titash Mondal**, Pragati Gahlout, Shreedhar Bhat
   Patent Number: US20220073745A1

Edited Book:

1. Title: Graphene-Rubber Nanocomposites-Fundamentals to Applications
   Publisher: CRC Press USA
   Editors: Dr. Titash Mondal and Prof. Anil K. Bhowmick
   Year: 2022

Textbook:

1. Title: Polymer Nanocomposites Based Flexible Electronics for Healthcare Monitoring
   Publisher: CRC Press USA
   Author: Dr. Titash Mondal (In press, to be published in 2023)

Book Chapters:

1. High Performance Thermoplastics Elastomers Based on Silicones by Dey, S, and **Mondal T.**. Advances in Thermoplastics Elastomers: Opportunities and Challenges, 2023, Elsevier

2. 1. Functionalization of Graphite and Graphene by Ghosh, A, Sharma, S, Bhowmick, A.K. and **Mondal T.**. Graphene-Rubber Nanocomposites-Fundamentals to Applications, 2022, CRC Press USA

3. Synthesis and characterization of graphene from non-conventional precursors by Roy, A, **Mondal T.**, Naskar, K, and Bhowmick, A.K. Graphene-Rubber Nanocomposites Fundamentals to Applications, 2022, CRC Press USA

4. Graphene based Hybrid fillers as New Reinforcing Agents in Rubber Compounds for the Tire Industry by Ghosh, B, Paul, S, Kar, S, Ghoshal, R, Roy, A, **Mondal T.** and Bhowmick, A. K. Graphene-Rubber Nanocomposites-Fundamentals to Applications, 2022, CRC Press USA

5. Polymer and its composition for printed electronics applications by Sharma, S, and **Mondal T.** Current Trends in Polymer Research for Advanced Applications, 2022, CRC Press USA

6. Pressure Sensitive Adhesive for Healthcare Applications by Saha S., **Mondal T.** Bhowmick A. K. Reference Module in Materials Science and Materials Engineering - Elsevier https://doi.org/10.1016/B978-0-12-820352-1.00106-1

7. Conjugated Polymers in Bioelectronics by Guchait A., Saxena A., Chattopadhyay S., **Mondal T.** Conjugated polymers for next generation of photovoltaics, energy storage, and electronics - Elsevier (Accepted/In-Press) (2021)

8. Thermally Conductive Plastics for Electronic Applications by Selvant M., **Mondal T.** Reference Module in Materials Science and Materials Engineering - Elsevier (2021); https://doi.org/10.1016/B978-0-12-820352-1.00099-7

9. Advanced Applications of Bio-degradable Green Composites by Konwar D. B., **Mondal T.** Bhat S. Biodegradable Packing for Non-Food Items 138-155 (2020) doi.org/10.21741/9781644900659-6

Membership of Professional Bodies:

1. Title: American Chemical Society Invited Member
   Agency: American Chemical Society
   Year: 2022-till date

Student Guidance:

1. **Ph.D. Students:** 09, Completed- 00; Ongoing: 09
2. **Master's Student:** 10, Completed- 08; Ongoing: 02

Courses Taught:

1. Physical Testing of Rubbers (Master's & Ph.D. Level) **Autumn Semester**
2. Rubber Product Manufacturing Technology (Master's & Ph.D. Level) **Spring Semester**
3. Rubber Process Engineering (B-Tech Level) **Spring Semester**
4. Rubber and Rubber Like Materials (B-Tech Level) **Autumn Semester**
5. Rubber Laboratory **Spring Semester**

Invited Talks:

1. 13th Graphene Conference, The University of Manchester, Manchester, United Kingdom, 2023
2. Invited Talk at the Hoya Vision Care, Minnesota, United States of America, 2023
3. Invited Talk at the ARLANXEO, Germany, 2023
4. National Technology Day 2023, Pidilite Industries Limited, Mumbai, India 2023
5. Technology Seminar 2023, Huntsman India Pvt. Ltd., Mumbai, India 2023
6. Invited talk in SPARC Workshop Indo-Australia, IIT Kharagpur, 2023
7. SPSI-MACRO Conference 2022, NCL Pune and IISER Pune, 2022
8. Cable-Tech Central Power Research Institute-2022
9. National Technology Day 2022, Himadri Specialty Carbon Black, Mumbai, India 2022
10. CURRENT TRENDS IN POLYMER SCIENCE 2022, Cochin University, 2022
11. E&ICT Sponsored FDP Program on "Manufacturing & Characterization of Advanced Materials", NIT Warangal, 2022
12. Invited Talk at the Henkel Industries, Pune, 2022
13. Research Colloquium Talk, Kent State University, United States of America, 2022
14. Invited talk in IIT Roorkee, IIT Roorkee, 2021

Sponsored & Consultancy Projects:

1. Development of Printed Elastomeric Electronic Skin for Healthcare Applications Science and Engineering Research Board (SERB)
2. Functional Ink for Printed Electronics: Synthesis, Characterization and Application Thereof ISIRD, SRIC, IIT Kharagpur
3. Determination of nitrogen content in polymeric blend, TVS Motors Limited
4. Technical Opinion on Chemical Compounds, Huntsman India Ltd.
5. Determination of Thermal Stability of Sealants, NICCO Engineering

Conference and Short Term Course Co-Organization:

1. Complex Fluid (CompFlu)Symposium 2022, IIT Kharagpur (International)
2. Recent Advancement in Rubber Technology 2023, (Short Term Course)

Awards

1. Inspire-Achieve Business Result, Momentive Performance Materials 2018/2019
2. Inspire-Achieve Personal Leadership, Momentive Performance Materials 2018/2019
3. Inspire-Trust & Team Work, Momentive Performance Materials 2019
4. EHS Inspirational Award, Momentive Performance Materials 2017
5. R&D Innovator of the Year, Momentive Performance Materials 2017
6. IUSSTF Travel Award, Indo-US Science and Technology Forum 2016

Skills:

- Nanomaterials synthesis and characterization
- Rubber Technology and Polymer Science
- Graphene and Graphene-Based Materials
- Polymer Nanocomposites
- Silicone-based Compositions
- Research and Development
- Project Management
- Publication and Patent Writing
- Teaching and Mentorship