

# UNIVERSITY OF CALCUTTA

## ACADEMIC DEPARTMENT

### FACULTY ACADEMIC PROFILE

1. **Full name of the faculty member:** DR. DEBARATI MITRA
2. **Designation:** Associate Professor & Head
3. **Specialization :** Petrochemicals & Petroleum Refinery Engineering
4. **Passport size photograph :**



5. **Contact information :**  
Department of Chemical Technology,  
University of Calcutta,  
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6. **Academic qualifications:**

College/ university from which the degree was obtained	Abbreviation of the degree
University of Calcutta	B. Tech (Chemical)
University of Calcutta	M. Tech (Petrochem. & Petroleum Ref. Engg)
Jadavpur University	Ph. D. (Engineering)

7. **Research interests:**
  - Bio- based products manufacture and characterization
  - Separation processes based on new solvents
  - Membrane based separation process

8. **Research guidance:**

Number of researchers awarded Ph.D: Five

Number of researchers pursuing Ph.D: Five

9. **Projects:**

**Completed projects:**

- i. Preparation of bio-nano composites and study of their biodegradation behavior, CRNN, University of Calcutta.
- ii. Production of fatty acid derivatives as components of biolubricants, UGC Major Research Project, Government of India.
- iii. Studies on the removal of polyaromatic hydrocarbons from diesel using pervaporation technique, DST Fast Track, Government of India.
- iv. Debenzenation of model pyrolysis gasoline using pervaporation technique”, WB-DSTBT, Government of West Bengal.

**Selected list of publications:**

a) **Journals:**

- i. An entropy- TOPSIS approach to find PMMA/cellulose based biocomposite with optimum mechanical and bio-degradation properties, **Polymer**, 313(2024)127696 <https://doi.org/10.1016/j.polymer.2024.127696>
- ii. Development of a renewable corrosion inhibiting agent from Acacia auriculiformis seed oil, **Green Materials**, <https://doi.org/10.1680/jgrma.24.00009>
- iii. Green synthesis and performance evaluation of mixed fatty acids-based esters as nonionic antifoaming biosurfactants, **Journal of Molecular Liquids** 398(2024)124314 <https://doi.org/10.1016/j.molliq.2024.124314>
- iv. Synthesis and Characterization of Polyesteramide Resin from Acacia auriculiformis Seed Oil for Surface Coating Application, **Journal of Polymers and the Environment** 32(2024) 2284-2298 <https://doi.org/10.1007/s10924-023-03105-4>
- v. Performance evaluation studies of PEG esters as biolubricant base stocks derived from non-edible oil sources via enzymatic esterification, **Industrial Crops and Products**, 195, 01(2023)116429 <https://doi.org/10.1016/j.indcrop.2023.116429>
- vi. Fabrication, characterization and performance analysis of different Ag/PVA nanocomposite membranes for debenzenation of model pyrolysis gasoline using pervaporation, **Composite Interfaces**, 30(12)(2023)1321-1341 <https://doi.org/10.1080/09276440.2023.2212995>
- vii. Influence of chlorite treatment on the fine structure of alkali pretreated sugarcane bagasse, **Biomass Conversion and Biorefinery**, 13(2023)567-581 doi:10.1007/s13399-020-01120-2
- viii. Immobilization of acetate based ionic liquids on silica gel to fabricate a prospective desulfurizing adsorbent, **Soft Materials**, 20(3)(2022)344-357 <https://doi.org/10.1080/1539445X.2022.2049307>
- ix. Studies on sorption kinetics and sorption isotherm for pervaporative separation of benzene from model pyrolysis gasoline using insitu nano silver/polyvinyl alcohol membrane, **Journal of Environmental Science and Health, Part A**, 56(13) (2021) 1397-1408 <https://doi.org/10.1080/10934529.2021.2002094>
- x. Separation of polyaromatic hydrocarbons from model diesel composition via pervaporation using a fabricated aromatic polyimide membrane and process optimization **Journal of**

- Environmental Progress and Sustainable Energy** 37,6(2018)1982-1992  
doi:10.1002/ep.12881
- xi. A kinetic study on the Novozyme 435-catalyzed esterification of free fatty acids with octanol to produce octyl esters, **Biotechnology Progress** 31, 6(2015)1494-1499.
- xii. Biodegradation Behaviour of PMMA/Cellulose Nanocomposites Prepared by In-situ polymerization and Ex-situ Dispersion Methods, **Polymer Degradation & Stability** 98,2(2013)635-642.
- b) **Books/ book chapters :**
- Coatings for Oil–Water Separation (Chap-17) in the book **Functional Coatings for Biomedical, Energy, and Environmental Applications**, John Wiley & Sons, First Edition, 2025, 399
  - Thermoelectric Effects (Chap-1) in the book **Thermoelectric Polymers Properties and Applications**, Materials Research Forum LLC, First Edition, 162(2024)1-23
  - Particulate Reinforced Composites (Chap – 5) in the book **Toughened Composites – Micro Macro systems**, CRC Press, First Edition, 2023, 55-68
  - Advanced separation applications of porous polymers (Chap – 8) in the book **Porous Polymer Science and Applications**, CRC Press, First Edition, 2022, 147-160
  - Water pollution and Remediation: Organic Pollutants, in the book, **Treatment of Petroleum Hydrocarbon Pollutants in Water**, Springer (2021)54, 229-275
- c) **Conference/ seminar volumes:**
- (1) Optimizing the composition of ionic liquids based adsorbent by Entropy-TOPSIS method for desulfurization of model diesel, 27th IUPAC International **Conference on Chemistry Education (ICCE 2024)**, Pattaya, Thailand
  - (2) Studies on adsorption isotherm and adsorption kinetics for the adsorptive removal of lead (II) and chromium (VI) from water by ionic liquids based adsorbent, **International Conference on Current Advances in Chemical Science Research and Education, 2024**, Mizoram University, Department of Industrial Chemistry, India
  - (3) Desulphurization of model jet fuel with choline chloride based deep eutectic solvent, oral presentation, **International Chemical Engineering Conference on Energy, Environment, and Sustainability (ICECEES), 2024**, IIT Roorkee Department of Chemical Engineering, India
  - (4) Elucidation of the interaction between ionic liquid based adsorbent and heterocyclic sulfur during desulfurization of model diesel, **International Conference on Recent Advances in Materials Chemistry and Catalysis (RAMCC), 2023**, Dibrugarh University, India
  - (5) Desulfurization of model aviation turbine fuel by a novel cellulose based ionic liquid adsorbent, **An International Conference on Energy Transition: Challenges and Opportunities, IICHE, CHEMCON 2023**, HIT Kolkata, India
  - (6) Preparation and characterization of in-situ nano Ag/PVA membrane for debenzenation of model pyrolysis gasoline using pervaporation, **ICRACACE 2022**, Jawahar Lal Nehru Technological University, Hyderabad, India
  - (7) Fabrication and Characterization of polyvinyl alcohol based membrane for pervaporative separation of benzene from model pyrolysis gasoline, **International Online Congress on**

**Membrane and Membrane Assisted Processes, 2021**, Mahatma Gandhi University, Kerala, India

**10. Membership of Learned Societies:**

- a) Indian Institute of Chemical Engineers
- b) Indian Chemical Society
- c) Indian Science Congress

**11. Patent:**

**AQUAPLUS: A HUMIDITY DEPENDENT WATER EXTRACTION METHOD**

Inventors

Ramesh Chandra Panda, Sandeepan Saha, Mahuya Das, Nadeem Ahmad Khan, Debayan Mandal, Sudhanshu Singh, Nitesh Singh Rajput, Tanay Pramanik, Moumita Pramanik, Souvik Mondal, Debarati Mitra, Subhojit Kundu, Mohammad Khan, Afzal Husain and Saood Manzar

Publication date 2021/4/21, Patent office Australia, Patent number 2021100831

**12. Invited lectures delivered:**

1. “Pervaporative removal of polyaromatic hydrocarbons from model diesel composition using a fabricated polyimide membrane and process optimization” in **2<sup>nd</sup> International Conference and Expo on Separation Techniques**, September 26-28, 2016 Valencia, Spain.

**13. Awards:**

- i. **DST Fast Track Young Scientist Award**