# Dr. MANISH YADAV

**Assistant Professor | Department of Chemical Engineering**

Institute of Chemical Technology, Mumbai – 400 019, India

md.yadav@ictmumbai.edu.in | manishyadavict@gmail.com

+91 9930225424 | +91 8976578212 | 022 33612034

## PROFESSIONAL PROFILE

Chemical Engineering academic at the Institute of Chemical Technology, Mumbai, with research and teaching experience spanning carbon nanostructures, crystallization, process development, battery materials, rare-earth recovery, and biomass conversion. Ph.D. in Chemical Engineering (2019) from ICT Mumbai.

## RESEARCH AREAS

Carbon nanostructures and CNT aerogels; crystallization and pharmaceutical materials; sodium-ion battery cathode materials; rare-earth recovery from end-of-life magnets and e-waste; fluidized-bed processes and carbochlorination; biomass thermochemical conversion and green hydrogen; process development and scale-up.

## ACADEMIC QUALIFICATIONS

| Degree | Year | Discipline | Institution | Marks |
|---|---|---|---|---|
| B.Chem Engg | 2012 | Chemical Engineering | Institute of Chemical Technology Mumbai | 70.15 |
| M.Tech | 2014 | Chemical Engineering | Indian Institute of Technology Gandhinagar | 87.00 |
| PhD | 2019 | Chemical Engineering | Institute of Chemical Technology Mumbai | ---- |

**Ph.D. thesis:** Synthesis and Characterization of Carbon Nanostructures

Guide: Professor Ashwin W. Patwardhan | Co-guides: Professor Jyeshtharaj B. Joshi and Dr Kinshuk Dasgupta | Institute of Chemical Technology Mumbai

**M.Tech thesis:** Analysis of nucleation kinetics for particle precipitation by antisolvent process

Guide: Professor Sameer V. Dalvi | Indian Institute of Technology Gandhinagar

## PROFESSIONAL EXPERIENCE

| Position | Institution | From | To |
|---|---|---|---|
| Assistant Manager | Eternis Fine Chemicals Ltd | 8th April 2019 | 23rd September 2019 |
| Assistant Professor | Institute of Chemical Technology Mumbai | 24th September 2019 | Till date |

## TEACHING EXPERIENCE

Undergraduate: Transport Phenomena; Separation Process; Chemical Engineering Operations; Process Safety.

Postgraduate: Advanced Transport Phenomena; Fundamentals of Continuous Unit Operations and Processes; Advanced Process Development and Engineering.

Research supervision: Master's in Chemical Engineering – 6 ongoing; 10 guided to date. Doctoral in Chemical Engineering – 3 ongoing.

## SPONSORED RESEARCH PROJECTS

| Project | Funding Agency | Funding (₹ lakh) | Status |
|---|---|---|---|
| Tailoring the catalytic activity of low dimensional carbon using dopants | University Grant Commission (UGC)- New Delhi | 10 | Completed |
| Continuous crystallization of active pharmaceutical ingredients | Department of Science and Technology (DST) *Under PURSE grant | 33 | Completed |
| Continuous synthesis of carbon nanotube aerogel using floating catalyst chemical vapor deposition for environmental applications | SERB-DST | 28.74 | Completed |
| Development of Carbochlorination Process for the Recovery of Rare Earth Elements (REE)from End-of-Life NdFeB Magnets in a Fluidized Bed Reactor | Ministry of Mines | 40.32 | Ongoing |
| Technology Demonstration Plant for the Production of 0.5 TPD Green Hydrogen from Pyrolysis + Gasification of Coconut Shell and Cashew Nut Shell | MNRE | 191.9 | Ongoing |

## EDITORIAL AND PROFESSIONAL APPOINTMENTS

- Associate Editor, Drying Technology (Taylor & Francis), from May 2026.
- Associate Fellow, International Academy of Drying Science and Technology (IADST), Macao.

## AWARDS AND RECOGNITION

| Award | Awarding Agency | Year |
|---|---|---|
| Best Oral Presentation Award, ICONSEA conference | JNTU Hyderabad | 2018 |
| Dr. K. H. Gharda Best Ph.D. Thesis Award | ICT Mumbai | 2020 |
| CIRCULARITY Open Innovation Challenge from Evonik | Evonik | 2024 |
| Faculty Mentor – First Prize, HMEL i-QUEST 2026 Innovation Challenge (HPCL-Mittal Energy Limited) | HMEL, Noida | 2026 |

## JOURNAL PUBLICATIONS

1. Tar mitigation strategies for fluidized bed gasifiers: Assessment of reactor configurations, thermodynamics and catalysts. *Fuel | 2027 | Vol. 428 Part B | Pages/article: Article 140236 | Impact factor: 7.8 | Corresponding author*
2. Modelling particle size distributions of co-precipitated NCM cathode material precursors for SIBs. *Indian Chemical Engineer | 2026 | Impact factor: 0.9 | Corresponding author*
3. Continuous manufacturing of co-crystals using spray drying: A comprehensive review. *Drying Technology | 2026 | Impact factor: 3.2 | Corresponding author*
4. Minor steps with major impact on biomass thermochemical conversion through drying and torrefaction. *Drying Technology | 2026 | Impact factor: 3.2 | Corresponding author*
5. Engineering insights into thermal plasma processing for plastic waste management: a review. *Reviews in Chemical Engineering | 2026 | Vol. 42 Issue 1 | Pages/article: 69-111 | Impact factor: 4.3*
6. From Bench to Bulk: Investigating Kinetics, Recyclability, and Scale-Up of ZIF-67. *Asia-Pacific Journal of Chemical Engineering | 2026 | Vol. 21 Issue 3 | Pages/article: e70212 | Impact factor: 1.7 | Corresponding author*
7. Cocrystallisation of carbamazepine with ascorbic acid: impact of additives on morphology, thermal stability, and dissolution properties. *Indian Chemical Engineer | 2025 | Vol. Not yet assigned | Pages/article: Jan-23 | Impact factor: 0.9 | Corresponding author*
8. Indomethacin cocrystals: a critical review of antisolvent-mediated strategies. *Proceedings of the Indian National Science Academy | 2025 | Pages/article: Jan-18 | Impact factor: 1.3 | Corresponding author*
9. Scalable synthesis and characterization of cobalt-free cathode active materials for sodium-ion batteries: Optimization of kinetic and hydrodynamic parameters. *Chemical Engineering Journal: Green and Sustainable | 2025 | Vol. Volume 1, Jan 2026 | Pages/article: 100002 | Impact factor: 12.5 | Corresponding author*
10. Influence of Tween 80 on Crystal Morphology, Particle Size, and Dissolution in Pharmaceutical Crystallization. *Crystal Research and Technology | 2025 | Vol. 60 Issue 11 | Pages/article: e70044 | Impact factor: 2.1 | Corresponding author*
11. Recent progress of Prussian white analogues as cathode active material for sodium-ion battery. *Journal of Alloys and Compounds | 2025 | Vol. 1039 | Pages/article: 183244 | Impact factor: 4.8 | Corresponding author*
12. Advances and Perspectives in ZIF-67 Synthesis for Hydrogen Applications: A Review. *Energy & Fuels | 2025 | Vol. 39 Issue 10 | Pages/article: 4610-4647 | Impact factor: 6 | Corresponding author*
13. Unravelling the polymorphic characteristics of carbamazepine through additive-assisted sonocrystallisation. *Indian Chemical Engineer | 2024 | Vol. 66, Issue 6 | Pages/article: 670-689 | Impact factor: 0.9 | Corresponding author*
14. Progress and prospects in cathode materials for sodium-ion batteries: synthesis, characterization, and engineering aspects. *Energy & Fuels | 2024 | Vol. 38 Issue 21 | Pages/article: 20285-20313 | Impact factor: 6 | Corresponding author*
15. Magnetic nanoparticles: A comprehensive review from synthesis to biomedical frontiers. *Langmuir | 2024 | Vol. 40 Issue 33 | Pages/article: 17239-17269 | Impact factor: 4.4 | Corresponding author*
16. Synthesis and characterization of coprecipitated layered NCM oxide as cathode for sodium-ion batteries: Kinetics and hydrodynamics studies. *Chemical Engineering Science | 2024 | Vol. 295 | Pages/article: 120177 | Impact factor: 5.1 | Corresponding author*
17. Advances in carbamazepine cocrystals: a review. *Crystal Research and Technology | 2024 | Vol. 59 Issue 4 | Pages/article: 2300296 | Impact factor: 2.1 | Corresponding author*
18. Jackfruit leaf–based natural adsorbent for the efficient removal of auramine O dye. *Water Conservation Science and Engineering | 2023 | Vol. 8 Issue 1 | Pages/article: 33 | Impact factor: 3.3 | Corresponding author*
19. Bioconversion of CO2 and potential of gas fermentation for mainstream applications: Critical advances and engineering challenges. *The Canadian Journal of Chemical Engineering | 2023 | Vol. 101 Issue 12 | Pages/article: 6774-6791 | Impact factor: 2.2 | Corresponding author*
20. Recent advancements in continuous crystallization of proteins. *Crystal Research and Technology | 2023 | Vol. 58 Issue 11 | Pages/article: 2300070 | Impact factor: 2.1 | Corresponding author*

21. Minireview on layered transition metal oxides synthesis using coprecipitation for sodium ion batteries cathode material: Advances and perspectives. *Energy & Fuels | 2023 | Vol. 37 Issue 21 | Pages/article: 16221-16244 | Impact factor: 6 | Corresponding author*
22. Dark fermentative biohydrogen production: recent advances and challenges. *Industrial & Engineering Chemistry Research | 2023 | Vol. 62 Issue 37 | Pages/article: 14755-14771 | Impact factor: 3.9 | Corresponding author*
23. Advances in the application of carbon nanotubes as catalyst support for hydrogenation reactions. *Chemical Engineering Science | 2023 | Vol. 272 | Pages/article: 118586 | Impact factor: 5.1*
24. Recent advances in the approaches to recover rare earths and precious metals from E-waste: A mini-review. *The Canadian Journal of Chemical Engineering | 2023 | Vol. 101 Issue 2 | Pages/article: 1043-1054 | Impact factor: 2.2 | Corresponding author*
25. Effect of Water Absorption on Mechanical Properties of Treated and Untreated Hemp Fiber Reinforced Polyester Composites. *Journal of The Institution of Engineers (India): Series E | 2022 | Vol. 103 | Pages/article: 199-208 | Impact factor: -*
26. Effect Of Alkali And Silane Treatment On Water Absorption And Mechanical Properties Of Sisal Fiber Reinforced Polyester Composites. *Metall. Mater. Eng. | 2022 | Vol. 28 | Pages/article: 641-656 | Impact factor: 0.9*
27. Carbon nanotubes in biomedical applications: current status, promises, and challenges. *Carbon Letters | 2022 | Vol. 32 | Pages/article: 1207-1226 | Impact factor: 6.2 | Corresponding author*
28. Kinetics of Carbon Nanotube Aerogel Synthesis using Floating Catalyst Chemical Vapor Deposition. *Industrial & Engineering Chemistry Research | 2021 | Vol. 60 | Pages/article: 2187-2196 | Impact factor: 3.9 | Corresponding author*
29. Hydrogen storage in boron-doped carbon nanotubes: Effect of dopant concentration. *International Journal of Hydrogen Energy | 2021 | Vol. 46 | Pages/article: 39297-39314 | Impact factor: 9.2*
30. Role of sulfur source on the structure of carbon nanotube cotton synthesized by floating catalyst chemical vapour deposition. *Chemical Physics Letters | 2020 | Vol. 748 | Pages/article: 137391 | Impact factor: 2.9*
31. Kinetic study of multi-walled carbon nanotube synthesis by thermocatalytic decomposition of methane using floating catalyst chemical vapour deposition. *Chemical Engineering Journal | 2019 | Vol. 377 | Pages/article: 119895 | Impact factor: 12.5*
32. Selective synthesis of metallic and semi-conducting single-walled carbon nanotube by floating catalyst chemical vapour deposition. *Diamond and Related Materials | 2019 | Vol. 97 | Pages/article: 107432 | Impact factor: 5.2*
33. Kinetic study of single-walled carbon nanotube synthesis by thermocatalytic decomposition of methane using floating catalyst chemical vapour deposition. *Chemical Engineering Science | 2019 | Vol. 196 | Pages/article: 91-103 | Impact factor: 5.1*
34. Controlling the carbon nanotube type with processing parameters synthesized by floating catalyst chemical vapour deposition. *Materials Today: Proceedings | 2019 | Vol. 18 | Pages/article: 1039-1043 | Impact factor: 1.4-2.8*
35. High Performance Fibers from Carbon Nanotubes: Synthesis, Characterization, and Applications in Composites—A Review. *Industrial & engineering chemistry research | 2017 | Vol. 56 | Pages/article: 12407-12437 | Impact factor: 3.9*
36. Few layered graphene by floating catalyst chemical vapour deposition and its extraordinary H2O2 sensing property. *Materials Letters | 2017 | Vol. 199 | Pages/article: 180-183 | Impact factor: 2.6*
37. Effect of ultrasound and stabilizers on nucleation kinetics of curcumin during liquid antisolvent precipitation. *Ultrasonics Sonochemistry | 2015 | Vol. 24 | Pages/article: 114-122 | Impact factor: 10.2*
38. Simple Criterion for Stability of Aqueous Suspensions of Ultrafine Particles of a Poorly Water Soluble Drug. *Langmuir | 2014 | Vol. 30 | Pages/article: 4576-4592 | Impact factor: 4*

## BOOKS AND BOOK CHAPTERS

1. Heat transfer in algal bioreactors. Authors: Channamallikarjun Sidramayya Mathpati Sarang Tamhankar , Manishkumar Dinesh Yadav. Elsevier, 2025.

2. Recent advances in the recovery of neodymium and dysprosium from industrial waste. Authors: Prathamesh P Khandekar, Bibek Dash, Manishkumar D Yadav. Elsevier, 2025.

3. Polymer Composites: Synthesis, Application, and Basic Theoretical Aspects. Authors: N Arora, S Dua, SV Purohit, B Dash, MD Yadav, BK Jena, T Senthilkumar. Springer, Singapore, 2024.

4. Bio-derived carbon nanostructures for environmental applications. Authors: Barsha Dash , Bibek Dash , Manishkumar D Yadav. Elsevier, 2024.

5. Polymer Nanocomposites in Supercapacitors (Chapter: Nanocellulose based supercapacitors). Authors: Jagtiani E. and Yadav M. D. CRC Press Taylor & Francis, 2022.

6. Handbook of Nanomaterials for Wastewater Treatment (Chapter: Advanced nanocomposite ion-exchange materials for water purification). Authors: Yadav M. D. Elsevier, 2021.

7. Encyclopedia of Nanoscience and Nanotechnology (Chapter: Fluidized Bed Synthesis of Carbon Nanotubes. Authors: Dasgupta K, Sharma A, Yadav M. D, Joshi J. B. American Scientific Publisher, 2018.

## PATENTS FILED

- Dasgupta K., Yadav, M.D., Joshi J. B., Madangopal K. " Single step process for continuous production of high purity carbon nanotube wool having tunable semiconducting or metallic characteristics"(Indian App. No. 201921029932)
- Yadav, M.D., Joshi, H.M., Joshi J.B.,Carbon Nanotube-Supported Catalysts and Method for Preparation Thereof (Indian App No. 202621084427)

## INVITED TALKS AND CONFERENCE CONTRIBUTIONS

- [1]. Invited Talk :: M.D.Yadav., “Chemical reaction engineering approach to the design of chemical vapor deposition reactors: a case study of carbon nanotubes” Indian Conference on Carbon materials,November 30- December 2, 2023, BARC, India
- [2]. Invited Talk :: M.D.Yadav., “Harnessing Carbon Nanotube-Supported Catalysts for Industrial Chemical Innovation” 16th International conference Carbon: Problems of Materials Science and Technology”, October 30th – November 1st, 2024 Lomonosov Moscow State University, Moscow, Russia.
- [3]. Invited Talk :: M.D.Yadav., “Two Day Conference-Cum-Exhibition On "Corrosion Challenges and Advancement in Corrosion Combating Materials”, March 14th and 15th, 2024 AMAI, Ahmedabad.
- [4]. M.D. Yadav, K. Dasgupta, A.W. Patwardhan, J.B. Joshi., “Substrate free synthesis of graphene nanosheets via chemical vapour deposition.” International Conference on Nanostructured Polymeric Materials and Polymeric Nanocomposites, ICNPM, November 13-15, 2015, Kottayam, Kerala, India.
- [5]. M.D. Yadav, K. Dasgupta, A.W. Patwardhan, J.B. Joshi., " Highly sensitive H2O2 sensor from graphene synthesized by chemical vapour deposition" International Conference on "Advances in Biological Systems and Materials Science in NanoWorld. ABSMSNW-2017, Varanasi, IIT-BHU.
- [6]. M.D. Yadav, K. Dasgupta, A.W. Patwardhan, J.B. Joshi., " Understanding the sorption capacity of MWCNTs by pH measurements”, International Conference on Nanoscience and Nanotechnology ICONN-2017, Chennai, SRM University.
- [7]. M.D. Yadav, K. Dasgupta, A.W. Patwardhan, J.B. Joshi., " Synthesis of single-walled carbon nanotubes: Kinetics and Reaction mechanism " CARBON- 2017: Carbon for grand challenges, Melbourne, Australia, July 23 - 28, 2017
- [8]. M.D. Yadav, K. Dasgupta, A.W. Patwardhan, J.B. Joshi., "Controlling the carbon nanotube type with processing parameters from floating catalyst chemical vapour deposition synthesis", IIT Roorkee, ICN:3I, December 6 - 8, 2017
- [9]. M.D. Yadav, K. Dasgupta, A.W. Patwardhan, J.B. Joshi., “Bulk scale synthesis of carbon Nanotubes using fluidized bed.” CHEMCON 2016, December 27-30, 2016, Chennai, Tamilnadu, India.
- [10]. M.D. Yadav, K. Dasgupta, A.W. Patwardhan, J.B. Joshi., "Effect of Hydrogen Concentration on Defect Density of Carbon Nanotube Aerogel Synthesized by Floating Catalyst Chemical Vapour Deposition" MNF 2018, IMDEA Materials, Madrid, Spain
- [11]. M.D. Yadav, K. Dasgupta, A.W. Patwardhan, J.B. Joshi., "Kinetic study of multi walled carbon nanotubes synthesis by thermocatalytic decomposition of methane using floating catalyst chemical vapour deposition",ISCRE- 2018, Italy.