# Dr. Abhijit Kakati

**Assistant Professor**
Department of Chemical Engineering
Indian Institute of Technology Guwahati
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## EDUCATION

| | |
|---|---|
| 2015-2020 | Doctor of Philosophy, Specialization in Petroleum Engineering from **Indian Institute of Technology Madras**, Chennai, India |
| 2013-2015 | Master of Technology, Specialization in Petroleum Exploration and Production from **Andhra University, Visakhapatnam, India** |
| 2009-2013 | Bachelor of Technology, Specialization in Petroleum Engineering from **Dibrugarh University, Dibrugarh, India** |

## WORK EXPERIENCE

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|---|---|
| 2021-Present | Assistant Professor, Department of Chemical Engineering, **Indian Institute of Technology Guwahati**, Kamrup, Assam, India |
| 2020-2021 | Assistant Professor, Department of Petroleum Engineering, **Pandit Dindayal Energy University**, Gandhinagar, Gujarat, India |

## PROFESSIONAL SERVICES

- Co-convener- "**International Conference on Petroleum, Hydrogen and Decarbonization**" at IIT Guwahati, 3-5 November 2023.
- Technical committee member - "**The 7th International Conference on Ocean Engineering (ICOE 2025)**" organized by Indian Institute of Technology Madras, 14-18 September 2025.
- Organizing Committee Member - **"National Symposium on Porous Media Research"** organized by IIT Hyderabad and India InterPore Chapter at IIT Hyderabad, 2 August 2025
- Technical Session Chair - *"Water, Energy and Environment"* at the **"National Symposium on Porous Media Research"** organized by IIT Hyderabad and India InterPore Chapter at IIT Hyderabad, 2 August 2025

- Revival Committee Member – **InterPore India Chapter**, 2024-2025
- Faculty Coordinator – **Federation of Indian Petroleum Industry (FIPI) IIT Guwahati Student Chapter**, 2022

## RESEARCH AREAS

- Flow through porous media
- Multiphase Flow
- Microfluidics
- Reservoir Engineering
- Enhanced Oil Recovery
- Functional Materials

## RESEARCH PROJECTS

- "Development of nanomaterials for Oil and Gas applications & establishment of nanotechnology laboratory in OIL" Funded by ***Oil India Limited, Duliajan***, 2023-2026.
- "Development of High Molecular Weight Aqueous Viscoelastic Polymer Composites for Enhanced Oil Recovery from Matured Indian Reservoirs" Funded by **Anusandhan National Research Foundation**, Govt. of India, 2022-2024.
- "Study on the role of viscoelastic behaviour of aqueous polymer solution in pore level microscopic displacement of crude oil from reservoir rocks" Funded by **Indian Institute of Technology Guwahati**, 2021-2023.

## PUBLICATIONS

Google Scholar: https://scholar.google.com/citations?user=TOpF3JIAAAAJ&hl=en

### Book Chapters

- Tripathi, R., Kakati, A., Jha, N.K., Nair, V.C. Low Salinity Water Flooding: Mechanism and Status. In: Sharma, T., Chaturvedi, K.R., Ganat, T., Ali, I. *Advancements in Chemical Enhanced Oil Recovery*, CRC Press 2024 Link
- Kakati, a., Sangwai, S. Low salinity surfactant flooding: role of surfactant and salt. In: T. Solling et al. (Eds.) *Surfactants in Upstream E&P*, 2021, pp. 225-243. Link
- Prasad, S., Kakati, A., Sangwai, S. Rheology of heavy crude oil and asphaltene-polymer composite blends. In: Thomas, S., Sarathchandran, C., Chandran, N. (Eds.) *Rheology of Polymer Blends and Nanocomposites*, Elsevier, 2019, pp. 168-188. Link

### Journal Papers

- Rahevar, S., Kakati, A., Kumar, G., Sangwai, J.S., Myres, M., Al-Yaseri. Controlled Salinity Water Flooding and Zeta Potential: Insight into A Novel Enhanced Oil Recovery Mechanism. *Energy Reports*, 9, 2023, 2557-2565.

- Chowdhury, S., Shrivastava, S., Kakati, A., Sangwai, S.J. Comprehensive review on the role of surfactants in the chemical enhanced oil recovery process. *Industrial Engineering and Chemistry Research* 2022, 61, 21-64. Link
- Sharma, A., Kakati, A., Sivabalan, S., Jadhawar, P., Sangwai, J.S. Evaluation of ionanofluid for chemical-enhanced oil recovery for matured crude oil reservoirs. International Journal of Oil, Gas and Coal Technology 2022, 29, 329-342. Link
- Al-Yaseri, A., Yekeen, N., Mahmoud, M., Kakati, A., Xie, Q., Giwelli, A. Thermodynamic Characterization of $H_2$-Brine-Shale Wettability: Implications for Hydrogen Storage at Subsurface. International Journal of Hydrogen Energy 2022, 47, 53, 22510-22521. Link
- Al-Yaseri, A., Yekeen, N., Al-Mukainah, H.S., Kakati, A., Alfarge, D., Myers, M. Rock-wettability impact on $CO_2$-carbonate Rock interaction and the attendant effects on $CO_2$ storage in carbonate reservoirs. Journal of Natural Gas Science and Engineering 2022, 104, 104664. Link
- Kakati A., Achinta, Bera, A., Al-Yaseri, A.Z. A review on advanced nanoparticle-induced polymer flooding for enhanced oil recovery. Chemical Engineering Science 2022, 262, 117994. Link
- Rana, J., Goindi, G., Kaur, N., Krishna, S., Kakati, A. Synthesis and application of cellulose acetate-acrylic acid-acrylamide composite for removal of toxic methylene blue dye from aqueous solution. Journal of Water Process Engineering 2022, 49, 103102. Link
- Kakati, A., Sangwai, J.S. Effect of monovalent and divalent salts on the interfacial tension of pure hydrocarbon-brine systems relevant for low salinity water flooding. *Journal of Petroleum Science Engineering* 2017, 157, 1106-1114. Link
- Kakati, A., Kumar, G., Sangwai, J.S. Oil recovery efficiency and mechanism of low Salinity-EOR for light crude oil with low acid number. *ACS Omega* 2020, 5, 1506-1518. Link
- Kakati, A., Kumar, G., Sangwai, J.S. Low salinity polymer flooding: effect on polymer rheology, injectivity, retention, and oil recovery efficiency. *Energy & Fuels* 2020, 34, 5715–5732. Link
- Kumar, G., Kakati, A., Sangwai, J.S. Stability of nanoparticle stabilized oil-in-water Pickering emulsion under high pressure and high temperature conditions: comparison with surfactant stabilized oil-in-water emulsion. *Journal of Dispersion Science and Technology* 2020, 1-4. Link
- Kakati, A., Sangwai, J.S. Wettability alteration of mineral surface during low-salinity water flooding: Role of salt type, pure alkanes, and model oils containing polar components. *Energy & Fuels* 2018, 32, 3127-3137. Link
- Kumari, R., Kakati, A., Nagarajan, R., Sangwai JS. Synergistic effect of mixed anionic and cationic surfactant systems on the interfacial tension of crude oil-water and enhanced oil recovery. *Journal of Dispersion Science and Technology* 2018, 1-13. Link

**Conference Papers**

- Khan, K, Das, B.K., Raidongia, K., Kakati, A. Amino Functionalized $V_2O_5$ Nanobelt Based Magnetically Recoverable Demulsifier for Low Temperature Crude Oil-Water

Separation. Presented at the *International Conference on Petroleum, Hydrogen and Decarbonization*, organized by Rajib Gandhi Institute of Petroleum Technology, Uttar Pradesh, India, 7-9 November 2025.

- Das, B.K., Raidongia, K., Kakati, A. Nano-composite of Hydrophobically Engineered Natural Clay nano-material and Modified EVA Co-polymer for Flow Assurance of Crude Oil. Presented at the *International Conference on Petroleum, Hydrogen and Decarbonization*, organized by Rajib Gandhi Institute of Petroleum Technology, Uttar Pradesh, India, 7-9 November 2025.
- Barman, D., Raidongia, K., Kakati, A. Study of Crude Oil Displacement by Microemulsions in Porous Medium using Microfluidics. Presented at the *National Symposium for Porous Media Research*, organized by IIT Hyderabad and India InterPore Chapter, India, 2nd August 2025.
- Pandey, A., Kakati, A. CFD Simulations of Crude Oil Displacement in Porous Media: Optimizing Viscosity and Injection Velocity for Enhanced Oil Recovery. Presented at the *National Symposium for Porous Media Research*, organized by IIT Hyderabad and India InterPore Chapter, India, 2nd August 2025.
- Das, B.K., Das, D., Karak, S., Raidongia, K., Kakati, A. Silica Coated Magnetically Recyclable Demulsifier for Efficient Separation of Crude Oil-Water Emulsion. Presented at the *International Conference on Petroleum, Hydrogen and Decarbonization*, organized by Indian Institute of Technology Guwahati, Kamrup, Assam, India, 3-5 November 2023.
- Kumar, G., Kakati, A., Mani, E., Sangwai, JS. Nanoparticle stabilized solvent-based emulsion for enhanced heavy oil recovery. Presented at SPE Canada Heavy Oil Technical Conference, Calgary, Alberta, Canada, 13-14 March, 2018. Link
- Kakati, A., Sangwai, J.S. Characterization of reservoir rock-fluid properties for low salinity water flooding in light paraffinic crude oil reservoir. Presented at ONGC CEWELL Symposium, Vadodara, Gujarat, India, 2-3 February, 2018. Link
- Kakati, A., Jha, N.K., Kumar, G., Sangwai, J.S. Application of low salinity water flooding for light paraffinic crude oil reservoir. Presented at SPE Symposium: Production Enhancement and Cost Optimization, Kuala Lumpur, Malaysia, 7-8 November, 2017. Link

## MEMBERS OF PROFESSIONAL SCOIENTIES

- InterPore, the International Society for Porous Media
- Society of Petroleum Engineer (SPE)
- European Association of Geoscientist and Engineers (EAGE)