

2nd International Conference and Expo on

Oil & Gas

December 02-03, 2019 | Dubai, UAE

Microbial origin biosurfactants in Enhanced Oil Recovery and their production strategies: A review**Tapas Medhi and Saurav Haloi**

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Microbial enhanced oil recovery (MEOR) is an alternative to EOR methods having advantages like low toxicity, bioequivalence, biodegradability, and economic feasibility for field implementation. The in-situ and ex-situ production of microbial metabolites and their application in laboratory scale study as well as in actual oil field condition, have their own merits and demerits, which require a multidisciplinary effort comprising of tools from Geophysics, Microbiology, Biochemistry, Soil Science, Chemical Engineering and Mechanical Engineering. Biosurfactants are amphipathic substances produced by a group of microbes like *Bacillus sp.*, *Pseudomonas sp.*, *Alcaligenes sp.*, *Achromobacters sp.*, *Burkholderia sp.*, *Clostridium sp.*, *Rhodococcus sp.*, etc., which play an imperative role in effecting efficient enhanced oil recovery through surface and interfacial tension (IFT) mitigation, wettability alteration, and viscosity reduction to increase permeability, etc. But, the main drawbacks to using biosurfactants of microbial origin in MEOR are their higher production cost and low production rates. Therefore, in this article, we primarily focused on different biotechnological approaches for incrementing biosurfactant production. Also,

we have summarized the success story of biosurfactant based MEOR technology in laboratory scale as well as in the field scale highlighting the economics crude oil recovery.

Speaker Biography

Tapas Medhi is currently working as Assistant Professor of Biochemistry and Bioprocess Engineering in the Department of Molecular Biology and Biotechnology, Tezpur University, Assam, India. He received his PhD from the Indian Institute of Technology (IIT), Kharagpur, India. He completed his Master of Science in Agriculture from the College of Agriculture, Assam Agricultural University, India. He then worked at the Institute of Biochemistry, Leipzig University, Germany as Postdoctoral Fellow in a DFG funded project on "Functionalisation of Hydrocarbons" for two years and as Assistant Professor at Tezpur University in India since 2006. He also acted as Head of the Oil and Natural Gas Corporation Ltd (ONGC) sponsored Centre for Petroleum Biotechnology (CPBT) for a three years term. He has authored several publications in various journals. His publications reflect his research interests in Cytochrome P 450 Biochemistry, biopesticides and bioremediation of crude oil contaminated soil. He is currently in charge of two ongoing scholarly projects on Phytoremediation and Microbial enhanced oil recovery.

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