World Academy of Science, Engineering and Technology
International Journal of Biotechnology and Bioengineering
Vol:18, No:03, 2024

Revealing Insights into the Mechanisms of Biofilm Adhesion on Surfaces in Crude Oil Environments

Authors : Hadjer Didouh, Mohammed Hadj Meliani, Izzaddine Sameut Bouhaik

Abstract : This study employs a multidisciplinary approach to investigate the intricate processes governing biofilm-surface interactions. Results indicate that surface properties significantly influence initial microbial attachment, with materials characterized by increased roughness and hydrophobicity promoting enhanced biofilm adhesion. Moreover, the chemical composition of materials plays a crucial role in impacting the development of biofilms. Environmental factors, such as temperature fluctuations and nutrient availability, were identified as key determinants affecting biofilm formation dynamics. Advanced imaging techniques revealed complex three-dimensional biofilm structures, emphasizing microbial communication and cooperation within these networks. These findings offer practical implications for industries operating in crude oil environments, guiding the selection and design of materials to mitigate biofilm-related challenges and enhance operational efficiency in such settings.

Keywords : biofilm adhesion, surface properties, crude oil environments, microbial interactions, multidisciplinary investigation
Conference Title : ICBER 2024 : International Conference on Biofilm Engineering and Research
Conference Location : Madrid, Spain
Conference Dates : March 18-19, 2024