World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:15, No:07, 2021

Effect of Asymmetric Amphiphilic Dicationic Ionic Liquids as Oil Spill Dispersants in Red Sea

Authors : Raghda El-Nagara, Maher I. Nessim, Carmen E. Elshafee, Renee I. Abdallah, Yasser M. Moustafa

Abstract : Three asymmetric dicationic ionic liquids (ADILs), 1-(2-(1-dodecyl-2-methyl-1H-imidazolium-3-yl)ethyl)-3-methyl pyridinium bromide (IL_1), 1-(6-(1-dodecyl-2-methyl-1H-imidazolium-3-yl)hexyl)-3-methyl pyridinium bromide (IL_2) and 1-(10-(1-dodecyl-2-methyl-1H-imidazolium-3-yl)decyl)-3-methyl pyridinium bromide (IL_3) were synthesized with yield of 83.54, 84.12 & 83.05% respectively. They were elucidated via conventional tools of analysis (elemental analysis, FT-IR, and 1H-NMR). The thermogravimetric analysis confirmed that the three ADILs possessed high thermal stability (up to 500°C). Their critical micelle concentration (CMC) was investigated and exhibited values of $5.5\text{-}1*10^{-3}$ Mol./L. They were evaluated as oil spill dispersants were at different temperatures (10, 30 & 50°C) with different concentrations (750, 1500, 2000, 3000 ppm). Data reveals that the efficiency is ranked as follows: $IL_2 > IL_1 > IL_3$, which showed high dispersion efficiency reached to 63% with the concentration of 1500 ppm.

Keywords : ionic liquids, amphiphilic, oil spill dispersants, dicationic, efficiency test
Conference Title : ICGMCS 2021 : International Conference on Green Materials Chemistry and Sustainability
Conference Location : Paris, France
Conference Dates : July 19-20, 2021