International Journal of Ambient Energy

ISSN: 0143-0750 (Print) 2162-8246 (Online) Journal homepage: http://www.tandfonline.com/loi/taen20

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To cite this article: Kalpajit Hazarika, Rahul Yadav, Subrata Borgohain Gogoi & Uttam K. Bhui (2018): Characterization of Crude Oil for Enhanced Oil Recovery: Study With Anionic Surfactant, International Journal of Ambient Energy, DOI: 10.1080/01430750.2017.1421573

To link to this article: https://doi.org/10.1080/01430750.2017.1421573

Accepted author version posted online: 03 Jan 2018.

Publisher: Taylor & Francis & Informa UK Limited, trading as Taylor & Francis Group
Journal: *International Journal of Ambient Energy*
DOI: 10.1080/01430750.2017.1421573

CHARACTERIZATION OF CRUDE OIL FOR ENHANCED OIL RECOVERY: STUDY WITH ANIONIC SURFACTANT

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ABSTRACT

Chemical enhanced recovery technique is used where thermal recovery is not feasible. It reduces the interfacial tension by forming microemulsion. In this paper characterization of crude oil in terms of chemical bonds present is investigated by Fourier transform infrared spectroscopy (FTIR). The peaks at different wave number shows saturated groups such as n-alkane –CH, -CH2, -CH3 and short chain of n-alkane C-C bond present in the oil samples. Since the crudes are collected from anionic reservoir, therefore Sodium Dodecyl Sulfate (SDS) of 0.4% Critical micelle concentration is suitable. It has been seen that the particle size is increased in case of surfactant solution with oil compared to without oil indicating entrapment of oil components inside the surfactant micelle. The larger absorptions of SDS from UV Spectroscopy are caused by electrons moving between π and π* orbitals due to the presence of more unsaturated groups in the solution.

Keywords: Enhanced Oil Recovery, FTIR, SDS, UV Visible spectroscopy, Absorption, Critical micelle concentration, interfacial tension.

1. Introduction

The use of surfactant in chemically enhanced oil recovery (CEOR) is to mobilize the residual oil saturation by generating a sufficiently (ultra) low crude oil/water interfacial tension (IFT) which give a capillary number large enough to overcome capillary forces and allow the oil to flow. Only 30-35% of oil can be produced by primary recovery mechanism. Rest of the oil can not be produced by reservoir pressure energy alone. Water and gas injection are generally used after primary drive to recover the residual oil. After secondary flooding depending on the formation type enhanced