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Dayanand Saini*

California State University, Bakersfield, California, USA

*Corresponding author: Dayanand Saini, California State University, Bakersfield, California, USA, E-mail: dsaini@csub.edu

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Introduction

This issue of Journal of Petroleum & Environmental Technology brings you 7 research articles, 3 short communications, and 1 editorial covering topics of current interest in the petroleum and biotechnology industry. Four research articles focus on topics related to several disciplines of upstream petroleum industry including stimulation technology, reservoir engineering, and drilling engineering. Two research articles cover geological and environmental aspects of upstream petroleum industry. One research article, a short communication, and an editorial report on relevant topics in the area of environmental biotechnology. One short communication covers a topic that is relevant to petroleum biotechnology and another short communication covers the topic relevant to downstream petroleum industry.

Upstream Petroleum Industry (Stimulation Technology, Reservoir Engineering, and Drilling Engineering)

Preliminary evaluation of silica sand in Sudan with respect to fracture sand evaluates the silica sand that is found in Sudan for its potential to act as proppant agent for hydraulic fracturing operations. The tested samples passed the API standards for sphericity, roundness, and turbidity. The mechanical testing results show that the sand can be used as proppant for reservoir with the closer pressure less than 3000 Psi; for pressure above 3000 Psi, the samples have to be coated for strength improvement.

Modeling of pressure dependence of interfacial tension behaviors of a complex supercritical CO₂ + live crude oil system using a basic parachor expression presents the results of a basic parachor model based modeling of pressure dependence of IFT behaviors of a complex supercritical CO₂ + live crude oil system for which experimentally measured input data is available in public domain. Very few researchers have used experimentally measured input data for performing parachor based modeling of the experimental IFT behaviors of complex supercritical CO₂ + live crude oil systems. This study is one of such efforts reported in published literature.

Impact of multi-ion interactions on oil mobilization by smart waterflooding in carbonate reservoirs provides new information on the influence of multi-ion interactions during smart water flood on carbonates. The results from zeta potential measurement showed that multi-ion interaction alters the rock surface charge, which led to more water-wetness. The study reports a significant improvement in oil displacement efficiency beyond the secondary waterflood that may be attributed to multi-ionic interactions.

The study of effective of added aluminum oxide Nano particles to the drilling fluid: the evaluation of two synthesis methods attempts to answer the question if the methods of preparation of Nano Al₂O₃

particle affect the behavior of Nano drilling fluid. According to the study, although the preparation method of Nano particle affects the behavior of Nano drilling fluid but this doesn't show any considerable effect. The difference between the results of ultrasonic drilling fluid and microwave Nano fluid can be bold under high temperature and high pressure conditions.

Geological and Environmental Issues Relevant to Petroleum Industry

Evaluation and prospect identification in the Olive Field, Niger Delta Basin, Nigeria, is focused on the evaluation of the Olive Field and the identification of new prospects within the field. The petrophysical parameters of the reservoirs showed a general decrease in quality in the basin ward direction from the most proximal well to the most distal well. Hydrocarbon typing showed that the reservoirs all contain gas. The field is highly faulted with the faults forming structures and seismic amplitude attribute maps hits the presence of four (4) prospects which may be tested for improving the viability of the field.

Smallholder farmer's perception of climate change and variability impact and their adaptation strategies in the upper and lower Niger River Basin Development Authority areas, Nigeria, attempts to analyze vulnerabilities and adaptation responses of smallholder farmers in the Upper and Lower Niger River Basin Development Authority areas (U & LNRBDA). Climate change adaptation may be regarded as response to climate change impacts and the study shows that smallholder farmers' indigenous knowledge of climate change and variability, its impacts and socio-economic consequences has proved invaluable for meaningful adaptation to cope with risks and threats of climate change and variability.

Environmental Biotechnology

Effect of constant temperature (20°C, 25°C, 30°C, 35°C, 40°C) on the development of *Parasarcophaga ruficornis* (FAB) (*Sarcophagidae: Diptera*) has major implications in forensic science. It was conducted to know the developmental rate of *Sarcophaga ruficornis* for seeking the temperature effect based methods for the P.M.I. (post mortem interval) related criminal investigation that are less interfering with the process of colonization, the development time and decomposition of the corpse by insects. The study concludes that to ensure a more accurate estimation of time of death, history of surrounding temperature and humidity in the location where a body was found must be taken into consideration.

Study: How to choose the topsoil describes the categories of topsoil that are based on levels of maintenance for the achievement of landscaping. The study provides detailed physical property requirements and chemical characteristics of top soil.

Calcifying bacteria: Their applications stresses on the development of such bacterial strains which would carry out calcium carbonate precipitation in extreme conditions. The process is a combination of biology and civil engineering disciplines and is gaining a lot of attention currently around the globe for variety of applications like conservation of monuments.

Petroleum Biotechnology

An experimental system to assess potential biological impact of operational response during an oil spill presents an experimental system designed to perform toxicity tests on fish in a potential scenario of dispersant application in an oil slick in near-shore areas. The present experimental approach seems of interest in order to establish a comprehensive framework in an emergency context and especially to dispersant use during an oil spill. However, the natural environment is

complex and full of interaction between biotic and abiotic parameters. These laboratory results can differ with in situ observations. Consequently, for a better comprehension of these interactions, these acute toxicity studies can be coupled with studies focused on the sub-lethal effects of oil-dispersant mixtures.

Downstream Petroleum Industry

Slurry phase hydrocracking of residue by phosphomolybdic and phosphotungstic acids reports on the comparison of hydrocracking activities of the vacuum residue of synthesized Heteropoly acid of phosphomolybdic, phosphotungstic acids with superacid of molybdenum antimony. The results suggest that the Phosphotungstic heteropoly acid could be useful for hydrocracking of residue instead of use superacid.