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Effect of Naphtha on the Composition of a Heavy Crude, in addition to a Cycle Steam Stimulation Process

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Abstract

The addition of solvent to cyclic steam stimulation is done to reduce the SOR (vapor oil ratio). Generally, in the middle or late stages once a certain pressure drop occurs in the process, this ratio can increase significantly.

Naphtha, which is generally used to transport heavy oil, is the solvent used in this investigation. The study of the use of naphtha in addition to the cyclic steam stimulation has been mainly oriented to the effect it achieves on the incremental recovery compared to the application of steam only. However, the effect of naphtha on the reactivity of crude oil components under conditions of cyclic steam stimulation or if its effect is the only dilution has not yet been considered. The present study aims to evaluate and analyze the effect of naphtha in conditions of cyclic steam stimulation, on the permanent composition of the improved oil, as well as the rheological behavior of crude oil, after varying the steam - naphtha ratio. Tests were carried out with the system solvent (naphtha) – oil (12.5 ° API, 4216 cP @ 40° C) - steam, in a batch micro-reactor, under conditions of cyclic steam stimulation (240 - 300 °C, 700-1400 psi). The characterization of the samples obtained was carried out by MALDI-TOF MS (matrix-assisted laser desorption/ionization time-of-flight mass spectrometry) and NMR (Nuclear Magnetic Resonance) techniques. The results indicate that there is a rearrangement of the microstructure of asphaltenes, resulting in a decrease in these and an increase in lighter components such as resins.

Biography:

Nora Andrea Guerrero Gómez is a Chemical Engineer graduated from the Industrial University of Santander. Specialist in instrumental chemical analysis of the Pontificia Universidad Javeriana. Master's student in Hydrocarbons Engineering of the Industrial University of Santander, belonging to the improved recovery research group of the same university.

Speaker Publications

"Simultaneous intercalated assembly of mesostructured hybrid carbon nanofiber/reduced graphene oxide and its use in electrochemical sensing Journal of Nanotechnology 2 November 2018";

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