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Enhanced oil recovery by injection of nanoemulsion systems

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Enhanced oil recovery methods (EOR) are applied primarily where conventional methods are not efficient to make a reservoir good productivity due to changes of physical-chemical properties, which makes the oil displacement by the pores of the reservoir to the surface increasingly complex. In this study, new nanoemulsion systems were applied to EOR experiments. Nanoemulsions are systems of practical interest because of the small droplet size, low surface tension and a small percentage of active mater in their composition. These systems were obtained from a pre-selected microemulsion system composed by: RNX 95 as surfactant, isopropyl alcohol as co-surfactant, kerosene as oil phase, and a water phase. The tests were conducted in a recovery device that simulates the conditions of a petroleum reservoir, using sandstone rock cores saturated with brine (KCl 20000 ppm) and petroleum (from Ubarana field - RN, Brazil). For the test of enhanced recovery, it was applied a nanoemulsion with 2.5wt% of co-sufactant/surfactant. Different percentages of polyacrylamide were added in the nanoemulsion to evaluate the influence of viscosity on the EOR results. The oil recovery reached 76.7% of recovered oil by using this improved method, when the percentage of polymer increased, and 90.0% of total oil recovery.

Biography

Tereza Neuma de Castro Dantas has completed his PhD at 1983 from the Institute Polytechnic of Toulouse, France. She is a Professor at Federal University of Rio Grande do Norte, Brazil. She has supervised 80 Master thesis and 30 PhD thesis, published 2 books, and 7 books chapters, 6 patents deposit and published more than 100 papers in reputed journals and serving as an editorial board member of repute ones. She is Executive Director of The Brazilian Association of Petroleum and Gas and Member of European Academy of Science.

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