

Paper estimability of heavy oil viscosity by nuclear magnetic resonances researchestitle

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Abstract

Copyright © 2014, Society of Petroleum Engineers. This paper presents the results of laboratory and nuclear magnetic resonances researches of seventy-seven crude oil samples from the Devonian, Carboniferous and Permian formations of Tatarstan oil fields with a wide range of viscosity varying from several cps to 60,000 cps. The results can be used to estimate the viscosity of the oil, including in situ viscosity. It has been found that the NMR relaxation characteristics of the tested samples presented in the form of T2 time distribution spectra confirm that crude oil is multicomponent. Numerical characteristics resulting from the analysis of the spectrum of spin-spin relaxation time T2 have been determined, which show good correlation with the viscosity of the hydrocarbon fluid. The paper presents the obtained experimental correlations between the rheological properties and NMR characteristics for oil samples studied.
