



Wettability and Its Sensitivity to Pore Geometry and Mineralogy

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During the time a reservoir is being exploited, the flow rate decreases affecting production, and hence, jeopardizing the economic viability of the project. So, it is common practice to perform oil recovery techniques in reservoirs and their grade of success will depend on some rock-fluid properties, such as the capillary pressure, viscosity of the existing fluids, relative permeability to water (k_{rw}) and to oil (k_{ro}) and the wettability of the system. This last property is related to the flow and storage in rock-fluids system and is the main subject of this work. The overall objective is to understand the influence of the wettability in oil flow and storage within, both, carbonate and sandstones samples by measuring the wettability of the samples, and analyzing how does the distribution of the pore size in the medium affects wettability in carbonate samples and how mineralogy influences wettability. To this end, carbonate and sandstones samples from Kocurek® will be used, as well as synthetic ones, if available on time. The experiment will obtain relative permeability x saturation and capillary pressure x saturation curves, by a unique experiment that will take place in the laboratory of fluids, located in Lenep, Macaé. The main equipment is a three-phase relative permeability system from Vinci® Technologies and the method used to calculate the relative permeability values is the JBN one. This equipment will measure and give the pressure in the samples and the effluent volumes of oil and brine over time allowing the calculation of the saturation with time. The software (Cydar®) will provide a plot of the k_{rw} and k_{ro} allowing the qualitative analysis. At the end of the procedure, it's expected to determine the wettability of the chosen samples, both qualitatively and quantitatively, corroborating the results. Also, to better understand the influence that mineralogy has upon the wettability of the chosen samples as well as the influence that the occurrence of pore sizes has in the carbonate samples by the analysis of the results. In other words, it is expected to get a better comprehension of the relationship between the wettability and texture and geometry characteristics of rocks.

Keywords: Wettability, Mineralogy, Pore Geometry

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