The Effect of Spent Acid on Carbonate Rock Wettability

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SUMMARY

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Title: The Effect of Spent Acid on Carbonate Rock Wettability
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Abstract
The research project I'm working on is aimed at improving the recovery of spent acid in carbonate reservoirs. In almost all carbonate gas reservoirs around the world, acid is injected into the well to remove near-wellbore damage and enhance permeability. The injected acid reacts with the rock and forms "spent acid" which mainly consists of water. Because of capillary trapping, it takes a very long time to recover the spent acid from the reservoir. In many cases, we are left with high irreducible water saturation in the zone invaded by spent acid. One of the most important factors that control spent acid recovery is rock wettability, which is a rock-fluid interaction property. Any fluid that comes in touch with the rock surface might change its wettability. In this project we study the alteration of wettability due to invasion of spent acid. We basically generate spent acid in the lab, and then inject it into a carbonate rock. After that we study the changes in the rock properties and its state of wettability. The goal is to identify the best acid composition that results in minimal formation damage and maximum spent acid recovery. In this poster, we will present the results of our experimental work on the effect of various acid concentrations on carbonate rock wettability. We also will present some of our analytical work on the effect of spent acid trapping on gas productivity.