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The Influence of Kaolinite and pH on Permeability in the Zubair Reservoir in the North Rumaila Oilfield, Southern Iraq

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SUMMARY

This research involves study of permeability declination as a result of kaolinite due to the changing in pH in the Zubair reservoir (Lower Cretaceous) during the secondary production by water injection method. Four wells and six core samples within the North Rumaila field are studied. Minerals have been diagnosed by XRD and SEM. The core samples mainly consist of quartz, with little quantity of the kaolinite. The effect of pH value on the permeability was examined through a series of laboratory experiments in the cases of gradual and sudden changing in pH. The final permeability decreased gradually at a rate of 20-30% M Darcy during the injection out with solution of pH 3 to 11 with getting formation damage up to 25%. While in during the sudden change of pH from acid to alkaline, a rapid and substantial reduction in the final permeability as average of 28% -72%, with a formation damaged rate of 44% were recorded. The results confirm that the acidic conditions is suitable for the reservoir stability, where the permeability discrepancy is attributed to the dispersion of kaolinite responding to the pH changes.

No extended abstract available.

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