

# **Adsorption Kinetics of Surfactant Used in CO<sub>2</sub>-Foam Flooding Onto Berea Sandstone**

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## **Abstract**

This paper reports adsorption/desorption kinetics and equilibrium onto Berea sandstone for a surfactant used as a CO<sub>2</sub>-water foaming agent. Also, foam stability of the surfactant is compared before and after adsorption/desorption has occurred. Results show that this surfactant's adsorption onto and desorption from Berea sandstone took several days to reach equilibrium. Both adsorption and desorption were characterized by a short period of rapid adsorption/desorption followed by a longer period of slower adsorption/desorption. Both adsorption and desorption processes were best fit by a pseudo-second-order kinetic model. Coefficients of adsorption and desorption rate were determined. A method to predict equilibrium adsorption density using adsorption process data over a relative short period is proposed, which saves considerable time in determining complete adsorption isotherms. Surfactant concentration and temperature affect equilibrium density. Foam stability is affected by selective surfactant adsorption onto the rock.