

Abstract Submitted
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Stability determination of crude oil emulsions by electrorheological measurement VLADIMIR ALVARADO, XIUYU WANG, HENRY PLANCHER, University of Wyoming, Department of Chemical and Petroleum Engineering — Emulsion stability is paramount to the success of many industrial applications and the remediation of naturally undesirable occurring fluid-fluid dispersions. Bottle tests and critical electric field (E_c) measurements are two commonly used techniques to interpret emulsion stability. In the former, the amount of water resolved after gravitational settling test or centrifugation as a function of time is used as an indicator of stability. Generally, the lower the total water fraction resolved, the higher the emulsion stability. In the second method, the value of E_c leading to drop coalescence is used as an indicator of stability. A larger value of E_c is a reflection of a more stable dispersion. The value of E_c is usually determined by measuring a sudden increase in electrical conductivity in water-crude oil emulsions as the field value is increased. In this work, an electrorheological test is used to establish the value of E_c and hence the stability criterion. Results of electrorheological measurements are compared to results of bottle tests for water-crude oil emulsions with or without stabilizing solid micro-particles. Results will show the consistency among the different measuring techniques, for a wide range of ionic strength and composition of the water phase and two crude oils.

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