Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Probing Interfacial Emulsion Stability Controls using Electrorheology[1] XIUYU WANG, AMY BRANDVIK, VLADIMIR ALVARADO, University of Wyoming — The stability of water-in-oil emulsions is controlled by interfacial mechanisms that include oil film rheology of approaching drops and the strength of drop interfaces. Film drainage is mainly a function of the continuous phase rheology. Temperature is used to regulate the viscosity of the continuous phase and hence determine its effect on emulsion stability through film drainage, in contrast with interfacial strength. In this study, one crude oil is used to formulate water-in-oil emulsions. Oil-water interfacial tension is measured to gauge other interfacial changes with temperature. The critical field value, used as proxy of emulsion stability, approaches a plateau value for each crude oil-aqueous solution pair, at sufficiently high temperature (50 ^{o}C), which is interpreted to reflect the intrinsic drop-coating film resistance to coalescence. Interfacial tension does vary significantly with either aqueous phase composition or temperature. From comparison with previous results, we speculate that drop coating film is composed of a fraction of asphaltic compunds.

[1]This material is based upon work supported by the University of Wyoming School of Energy Resources through its Graduate Assistantship program and the Enhanced Oil Recovery Institute

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Date submitted: 06 Aug 2010 Electronic form version 1.4