

Abstract Submitted  
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**Stratification in micellar foam films as a probe for intermicellar interactions** CHRYSTIAN OCHOA, University of Illinois at Chicago, SHANG GAO, SAMANVAYA SRIVASTAVA, University of California at Los Angeles, VIVEK SHARMA, University of Illinois at Chicago — Sodium Naphthenate (NaN) found in crude oils can act as surfactants and influence the stability, lifetime and rheology of petroleum foams and emulsions. Here, we show that foam films formed by aqueous micellar solutions of NaN exhibit step-wise thinning or stratification, due to the influence of non-DLVO forces, including supramolecular oscillatory structural forces. We utilize Interferometry, Digital, Imaging, Optical Microscopy protocols, previously developed by our group, to investigate the drainage and stratification in micellar foam films ( $<100$  nm) with high spatial (thickness  $<10$  nm) and temporal resolution ( $<1$  ms). We determine how the NaN concentration influences the nanoscopic topography, stratification kinetics and step size of foam films, and contrast the results with behavior observed with stratifying foams made with sodium dodecyl sulfate (SDS) solutions. We span a relatively wide concentration range, such that micelle shape and size vary, as is revealed by complementary small angle x-ray scattering experiments.

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