Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Dynamic surface tension measurements of ionic surfactants using maximum bubble pressure tensiometry CAMILLA U. ORTIZ, NORMAN MORENO, VIVEK SHARMA, Chemical Engineering, University of Illinois at Chicago — Dynamic surface tension refers to the time dependent variation in surface tension, and is intimately linked with the rate of mass transfer of a surfactant from liquid sub-phase to the interface. The diffusion- or adsorption-limited kinetics of mass transfer to interfaces is said to impact the so-called foamability and the Gibbs-Marangoni elasticity of surfaces. Dynamic surface tension measurements carried out with conventional methods like pendant drop analysis, Wilhelmy plate, etc. are limited in their temporal resolution (>50 ms). In this study, we describe design and application of maximum bubble pressure tensiometry for the measurement of dynamic surface tension effects at extremely short (1-50 ms) timescales. Using experiments and theory, we discuss the overall adsorption kinetics of charged surfactants, paying special attention to the influence of added salt on dynamic surface tension.

Vivek Sharma
Univ of Illinois - Chicago

Date submitted: 13 Nov 2016 Electronic form version 1.4