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Stratifying Foam Films and Micelle Aggregation Number SUBINUER YILIXIATI, YIRAN ZHANG, VIVEK SHARMA, Chemical Engineering, University of Illinois Chicago — The shelf-life, stability and rheology of liquid foams depends upon the processes that drive drainage and rupture in thin liquid films. Foam films containing micelles, colloidal particles or polyelectrolyte-surfactant mixtures exhibit step-wise thinning or stratification, often attributed to the formation of ordered structures and the layer-by-layer removal of them. Using a Scheludko-type cell, we experimentally study the stratification kinetics of horizontal foam films formed by aqueous sodium dodecyl sulfate (SDS) solutions, and carefully determine how the concentration of surfactant influences the stepwise thinning process. We elucidate how quantitative characterization of stratification provides a method for measuring dynamic disjoining pressure, as well as for estimating micelle size and interactions. The concentration-dependent aggregation number, and micelle charge extracted from our experiments match-up reasonably well with values obtained by other techniques including scattering and fluorescence.

Vivek Sharma
Chemical Engineering, University of Illinois Chicago

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