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Drainage and Stratification Kinetics of Foam Films YIRAN ZHANG, VIVEK SHARMA, University of Illinois at Chicago — Baking bread, brewing cappuccino, pouring beer, washing dishes, shaving, shampooing, whipping eggs and blowing bubbles all involve creation of aqueous foam films. Foam lifetime, drainage kinetics and stability are strongly influenced by surfactant type (ionic vs non-ionic), and added proteins, particles or polymers modify typical responses. The rate at which fluid drains out from a foam film, i.e. drainage kinetics, is determined in the last stages primarily by molecular interactions and capillarity. Interestingly, for certain low molecular weight surfactants, colloids and polyelectrolyte-surfactant mixtures, a layered ordering of molecules, micelles or particles inside the foam films leads to a stepwise thinning phenomena called stratification. Though stratification is observed in many confined systems including foam films containing particles or polyelectrolytes, films containing globular proteins seem not to show this behavior. Using a Scheludko-type cell, we experimentally study the drainage and stratification kinetics of horizontal foam films formed by protein-surfactant mixtures, and carefully determine how the presence of proteins influences the hydrodynamics and thermodynamics of foam films.

Vivek Sharma
University of Illinois at Chicago

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