

Abstract Submitted
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Effect of surfactant on kinetics of thinning of capillary bridges¹

EMILIA NOWAK, NINA KOVALCHUK, MARK SIMMONS, University of Birmingham — Kinetics of thinning of capillary bridges is of great scientific and industrial interest being of vital importance for example in various emulsification and microfluidic processes. It is well known that the rate of bridge thinning is proportional to the interfacial tension. Therefore it is expected that the process should slow down by addition of surfactant. The kinetics of capillary bridges in the presence of surfactant was studied by the dripping of liquid from a capillary tip under conditions of nearly zero flow rate ($We \ll 1$). The tested liquids were aqueous solutions of sodium lauryl ether sulphate (SLES), which is broadly used in personal care products. The viscosity, surfactant activity and adsorption kinetics have been controlled by addition of glycerol and sodium chloride. The study has shown that the kinetics of capillary bridges are determined by dynamic surface tension rather than by its equilibrium value. In particular, the kinetics of the bridge thinning for the 0.1 g L⁻¹ aqueous SLES solution is practically the same as that of pure water despite twice lower equilibrium surface tension.

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