

Abstract Submitted
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Formation of surfactant-laden drops: comparison of experimental and numerical results¹ NINA KOVALCHUK, University of Birmingham, LYES KAHOUADJI, Imperial College London, MARK SIMMONS, University of Birmingham, RICHARD CRASTER, OMAR MATAR, Imperial College London, DAMIR JURIC, JALEL CHERGUI, LIMSI, CNRS, France, SEUNGWON SHIN, Hongkin University, South Korea — Drop formation is ubiquitous in many industrial processes, with surfactants being commonly used to stabilise drops. Thus, understanding the regularities of drop formation and accompanying processes, such as formation of satellite droplets in the presence of surfactant is of high importance. Here we present the results of a comparative experimental and numerical study on formation of surfactant-laden drops over a range of flow rates and surfactant concentrations. The precise parameters of the surface tension isotherm for surfactants used in the experimental study are implemented in the numerical code enabling quantitative comparison between the two approaches. It is shown that the effect of surfactant depends not only on concentration, but also on the value of critical micellar concentration (cmc). The transition to the regime where satellite droplets are no longer released was observed when the flow rate exceeded a threshold value depending on surfactant concentration and cmc value.

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