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Influence of the surface viscosities on the pinching of a pendant droplet loaded with SDS[1] MIGUEL A. HERRADA, Universidad de Sevilla, ETSI, 41092 Sevilla, Spain, ALBERTO PONCE-TORRES, MANUEL RUBIO, JOSE M. MONTANERO, Depto. de Ingeniera Mecnica, Energtica y de los Materiales, Universidad de Extremadura, E-06006 Badajoz — The interfacial viscosities of relatively viscous insoluble surfactants are known to affect the dynamics of a liquid thread close to the free surface pinching [1]. Here, we analyze both numerically and experimentally the breakup of a pendant water drop loaded with SDS. We focus on the influence of the monolayer of SDS on the free surface minimum radius R_{min}. The results show remarkable agreement between the experiments and numerical simulations for the pure DIW case. When a surfactant is introduced, it creates a monolayer that alters the pinchoff dynamics. If only solute-capillarity and Marangoni convection are considered in the numerical simulations, there is a measurable deviation with respect to the experimental results for $R_{min}(\tau) < 5$ μm. We considered the surface shear and dilatational viscosities in the simulation to reproduce the entire range of experimental data. The value of the shear viscosity is consistent with the upper bound reported in the literature [2]. [1] A. Ponce-Torres, J. M. Montanero, M. A. Herrada, E. J. Vega, and J. M. Vega, Phys. Rev. Lett. 118,024501 (2017). [2] Z. A. Zell, A. Nowbahar, V. Mansard, L. G. Leal, S. S. Deshmukh, J. M. Mecca, C. J. Tucker, and T. M. Squires, Proc. Natl. Acad. Sci. 111,3677 (2014)

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