

Abstract Submitted
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Drop-interface partial coalescence in polymeric fluids JAMES J. FENG, PENGTAO YUE, CHUNFENG ZHOU, XIAOPENG CHEN, Department of Chemical and Biological Engineering, University of British Columbia — A drop falling onto a fluid-fluid interface may not merge with it at once but undergo a so-called partial coalescence cascade. We will discuss recent experimental observations and numerical simulations of this phenomenon for Newtonian as well as polymeric fluids. In Newtonian fluids, the partial coalescence takes place for an intermediate range of drop sizes and consists of viscous, inertio-capillary and gravity regimes. Viscoelasticity in either the drop or the ambient fluid tends to delay the pinch-off of the secondary drop, and may even suppress partial coalescence altogether. The underlying mechanism is large tensile polymer stresses resisting the stretching and thinning of the fluid neck. The numerical results are in qualitative, and in some cases quantitative, agreement with experiments.

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