Abstract Submitted
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Separation and Stabilization of Deformable Drops in Microfluidics[1] WINGKI LEE, Carnegie Mellon University, KATHARINA SCHRANK, RWTH Aachen University, LYNN WALKER, SHELLEY ANNA, Carnegie Mellon University — Microfluidic processes are effective for producing highly monodisperse droplet streams, but some desired processes inherently require the formation of polydisperse droplet populations. As an example, tipstreaming produces micron scale droplets along with larger drops that are 10-100 microns in size. Separation of these sizes is needed in order for the process to be useful. We have designed a microfluidic separator allowing fractionation of droplet sizes on-the-fly along with the injection of a surfactant-laden stream for further downstream stabilization of the fractionated emulsion. The behavior of the device is different for deformable emulsions than rigid particles, although the design can work for either. We report on the performance of the device as well as size distributions resulting from the fractionated populations.

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