

Abstract Submitted  
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**Bubble production using a Non-Newtonian fluid in microfluidic flow focusing device** YI-LIN WANG, National Taiwan University of Science and Technology, THOMAS WARD, CHRISTINE GRANT, North Carolina State University — We experimentally study the production of micrometer-sized bubbles using microfluidic technology and a flow-focusing geometry. Bubbles are produced by using a mixture containing aqueous polyacrylamide of concentrations ranging from 0.01-0.10% by weight and several solution also containing a sodium-lauryl-sulfate (SLS) surfactant at concentrations ranging 0.01-0.1% by weight. The fluids are driven by controlling the static pressure above a hydrostatic head of the liquid while the disperse phase fluid static pressure is held constant (air). In the absence of surfactant the bubble production is discontinuous. The addition of surfactant stabilizes the bubble production. In each type of experiment, the bubble length  $\ell$ , velocity  $U$  and production frequency  $\omega$  are measured and compared as a function of the inlet pressure ratio. The bubbles exhibit a contraction in their downstream length as a function of the polymer concentration which is investigated.

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