

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Confined microbubbles at high capillary numbers¹ MARTIN SAUZADE, THOMAS CUBAUD, Stony Brook University — We experimentally investigate the flow behavior of bubbles in highly viscous silicone oils within various microgeometries. A square focusing section is used to examine the bubble generation process at large capillary numbers. We notably vary the continuous phase viscosity from 1 to 10,000 cS and study the dynamics of interfacial cusps during bubble pinch-off. The resulting segmented flows are then scrutinized in straight microchannels for both dissolving and non-dissolving bubbles. Finally, we examine the motion of bubbles in periodically constricted microchannels over a wide range of flow conditions. Our findings highlight the possibility to control and exploit the interplay between capillary and mass transfer phenomena with highly viscous fluids in microsystems.

¹This work is supported by NSF (CBET- 1150389)

Thomas Cubaud
Stony Brook University

Date submitted: 01 Aug 2014

Electronic form version 1.4