Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

A co-flow-focusing monodisperse microbubble generator JIAMING ZHANG, ERQIANG LI, SIGURDUR SIGURDUR, King Abdullah University of Science and Technology — Here we report the design and fabrication of a simple and inexpensive microfluidic device based on micro-scope glass slides and two tapered glass capillaries, for generating monodisperse microbubbles. The first capillary that used for transporting gas, was heated and pulled to have a sharp tapered tip around 2 microns, and was inserted into the second capillary, with its sharp tip aligned to the converging-diverging throat of the second capillary. This configuration provides a smooth, small gas flow rate, as well as a high velocity gradient at the gas outlet. By varying liquid flow rates and viscosities, highly monodisperse microbubbles with diameter range from 3.5 to 50 microns have been successfully produced, at a rate up to 50 kHz. A simple scaling law based on capillary number and flow rate ratios, used to predict bubble size, is also proposed.

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Date submitted: 01 Aug 2013 Electronic form version 1.4