Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

Liquid crystal droplet production in a microfluidic device BEN HAMLINGTON, Washington University, JAMES FENG, University of British Columbia , DARREN LINK, Rain Dance Technology, MICHAEL SHELLEY, New York University, AMY SHEN, Washington University — Liquid crystal drops dispersed in a continuous phase of silicone oil are generated with a narrow distribution in droplet size in microfluidic devices both above and below the nematic to isotropic transition temperature. We observe different dynamics in liquid crystal droplet generation, coalescence, and distinct droplet morphology by altering the microchannel surface energy. The effect of the defect structures of the nematic liquid crystal can lead to distinctly different scaling of droplet size in comparison to the Newtonian system. Capillary instabilities in thin nematic liquid crystal filament has additional contribution from anisotropic effects such as surface gradients of bending stress which can provide extra instability modes compared to that of isotropic fluids.

Amy Shen
Washington University

Date submitted: 07 Aug 2006 Electronic form version 1.4