

Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Finite Bond number effects in the dripping nozzle SUHWAN CHOI, THOMAS WARD, North Carolina State University — The pressure-drop in a dripping nozzle generated by hydrostatic pressure and surface tension is studied by both theory and experiments. As the hydrostatic pressure is varied in each experiment, the measured pressure-drop can change sign depending on a inner tip diameter, Bond number, angle of valve, and viscosity. The viscous fluids used in the experiments are glycerol-water mixtures with viscosities ranging from 0.176 to 1.09 Pa s and silicone oil having a viscosity of 0.418 Pa s and higher Bond number compared with the mixtures. The pendant drop growth is taken by CCD camera to make observations. The images are examined for the radius of the drop as a function of time and compared with the derived momentum equation which include Bond number effects. We propose a process to use the analysis for estimating the surface tension without the need to measure the interface curvature.

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Date submitted: 05 Aug 2011

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