

Abstract Submitted  
for the DFD12 Meeting of  
The American Physical Society

**A pipette dispenses a charged droplet**<sup>1</sup> DONGWHI CHOI, HORIM LEE, Mechanical engineering, POSTECH, DO JIN IM, IN SEOK KANG, Chemical engineering, POSTECH, KWAN HYOUNG KANG, Mechanical engineering, POSTECH — Micropipettes are widely used in many scientific and engineering fields. However, it is hardly known that a droplet dispensed from a plastic pipette tip has a considerable amount of charges (order of 10-10 C). Here we report that the charged droplet is dispensed from a commercial and disposable plastic pipette tip and this charge is originated from the natural electrification between a solution and the inner surface of the pipette tip. The charge amount is dependent on not only the physicochemical properties of a solution (e.g., pH and a concentration) but also dispensing environments (e.g., atmospheric humidity and type of commercial pipette tip). To investigate the effects of the charge on the droplet dispensing, we calculate the electrical force between the droplet and the pipette tip through numerical simulation. The micropipette users especially, who are dealing with discrete droplets in their experiments, should consider this charge effect in their dispensing of a droplet.

<sup>1</sup>This work was supported by the National Research Foundation of Korea (NRF) Grant No. R0A-2007-000-20098-0 funded by the Korea government (MEST) and No. 20090083510 through Multiphenomena CFD Engineering Research Center.

Dongwhi Choi  
Mechanical engineering, POSTECH

Date submitted: 07 Aug 2012

Electronic form version 1.4