

Abstract Submitted  
for the DFD05 Meeting of  
The American Physical Society

**Simple and double emulsions via electrospray** ANTONIO BARRERO, ALVARO G. MARIN, Universidad de Sevilla, IGNACIO G. LOSCERTALES, Universidad de Malaga — Generation of nanoemulsions is of great interest in medical and pharmaceutical applications; drug delivery or antiviral emulsions are typical examples. The use of electrosprays for dispersing liquids inside liquid insulator baths have been recently reported, (Barrero et al. *J. Colloid Interf. Sci.* **272**, 104, 2004). Capsules, nanotubes and coaxial nanofibers have been obtained from electrified coaxial jets (Loscertales et al. *Science* **295**, n. 5560, 1695, 2002; *J. American Chem. Soc.* **126**, 5376, 2004). Here we present a method for making double emulsions (both water-oil-water and o/w/o) based on the generation of compound electrosprays inside insulator liquid baths. Basically, a conducting liquid injected throughout a capillary needle is electroatomized in cone-jet mode inside a dielectric liquid bath. A third insulating liquid is injected inside the Taylor cone to form a second meniscus. Then, a steady coaxial jet, in which the insulating liquid is coated by the conducting one, develops. A double emulsion forms as a result of the jet breaking up into compound droplets electrically charged. Experimental results carried out with glycerine and different oils in a bath of heptane are reported.

Antonio Barrero  
Universidad de Sevilla

Date submitted: 10 Aug 2005

Electronic form version 1.4