

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Picoliter Droplets of Controlled Composition for SERS Studies

CHRYSAFIS ANDREOU, MARTIN MOSKOVITS, CARL MEINHART, UCSB —
Generation of picoliter scale droplets of specified composition is a valuable tool for chemical analysis and synthesis, with many bioanalytical lab-on-chip applications. Here we present a microfluidic droplet generator that creates water-in-oil droplets of picoliter volume, by merging two laminar aqueous streams immediately before the droplet-generating junction. We use this device to investigate the dependence of surface enhanced Raman spectroscopic signal on the availability of silver nanoparticles, and analyte. By controlling the composition of the generated droplets, we can limit the availability of plasmonic nanoparticles and analyte molecules with unprecedented accuracy. Experiments, as well as numerical simulations, are used to investigate the plasmonic enhancement stemming from small numbers of silver nanoparticles confined within the droplets.

Chrysafis Andreou
UCSB

Date submitted: 31 Jul 2014

Electronic form version 1.4