

Abstract Submitted  
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**On the pH of Aqueous Attoliter-Volume Droplets<sup>1</sup>** KIERAN P. RAMOS, SAMSON S. VELPULA, TREVOR B. DEMILLE, RYAN PAJELA, LORI S. GOLDNER, Department of Physics, University of Massachusetts Amherst — Droplets of water dispersed in perfluorinated liquids have widespread use including microfluidics, drug delivery and single-molecule measurements. Perfluorinated liquids are distinctly biocompatible due to their stability, low surface tension, lipophobicity, and hydrophobicity. For this reason, the effect of the perfluorinated surface on droplet contents is usually ignored. However, as the droplet diameter is reduced, we expect that any effect of the water/oil interface on droplet contents will become more obvious. We studied the pH of attoliter-volume aqueous droplets in perfluorinated liquids using pH-sensing fluorescent dyes. Droplets were prepared either by sonication or extrusion from buffer and perfluorinated liquids (FC40 or FC77). A non-ionic surfactant was used to stabilize the droplets. Buffer strength, ionic strength, and pH of the aqueous phase were varied and resulting droplet pH compared to the pH of the buffer from which they were formed. Preliminary data are consistent with a pH in droplets that depends on the concentration of non-ionic surfactant. At low surfactant concentrations, the pH in droplets is distinctly lower than the stock buffer. However, as the concentration of non-ionic surfactant is increased the change in pH decreases.

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