

Abstract Submitted
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Using Microfluidics for Droplet and Particle Characterization of Environmental Fluids ANDREW METCALF, CHRIS HOGAN, CARI DUTCHER, Univ of Minn - Minneapolis — Two-phase flows in microfluidic platforms enable high-throughput experiments for measurement of rheological, thermodynamic, and kinetic interfacial properties. In this talk, I will highlight biphasic microfluidic studies with environmental applications, including atmospheric aerosol properties and water contamination. For example, the fate of atmospheric aerosol particles can be profoundly affected by the presence of surface-active species within the aerosol liquid. In this work, the presence of these species is detected with microfluidic interfacial tensiometry, in which the behavior of the droplet interface under extensional shear is measured. Both secondary organic aerosol chemical mimics and aerosol filter extracts are used in droplet generation. In addition, preliminary work for use of the platform for water treatment applications will be highlighted. Particulate contamination in water can be detected by freezing contaminated droplets at different temperatures to study the perturbed thermodynamic state.

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