

Measurements of Interfacial Properties of Aerosol Liquid Samples using Biphasic Microfluidics

Objective: Measure interfacial (aqueous-organic and aqueous-vapor) properties using a biphasic microfluidic platform to inform ambient aerosol mixing state models and advance current understanding of particle structure.

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(Unfunded) Collaborators: Arthur Chan, Jason Surratt, Qi Zhang, John Shilling

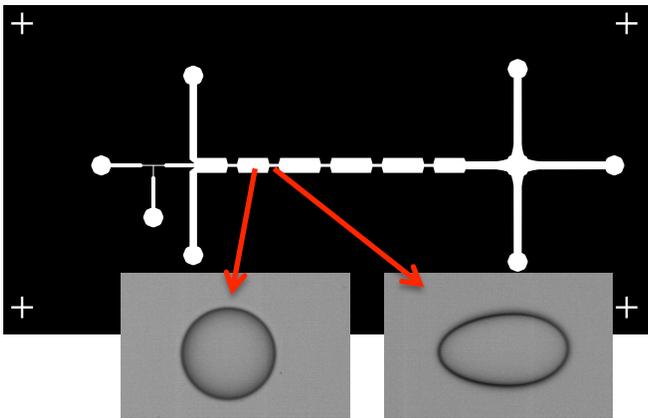
Funding status: planned

Challenges or needed resources/collaborators: Collaborators who wish to provide relevant chemical compounds or collected particles for testing and analysis in the microfluidic device.

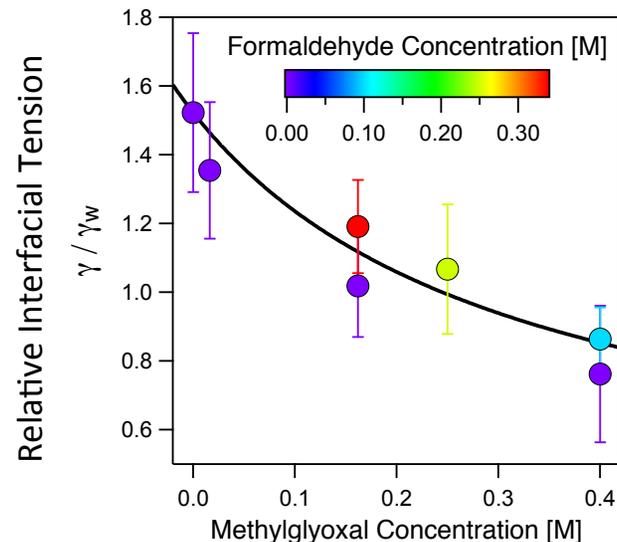
Summary of progress: Interfacial tensions of aged aqueous methylglyoxal, formaldehyde, and ammonium sulfate mixtures were measured with our microfluidic experimental platform [Metcalf et al., ES&T, 2016]. We have obtained aerosol liquid samples from several collaborators and are performing measurements on these samples. Future work will improve the measurement technique to allow smaller volumes of sample solution which will better facilitate measurements of ambient aerosol liquid samples (from extracted filters or other liquid collection methods).

Interfacial Tension of Aerosol Liquid Samples

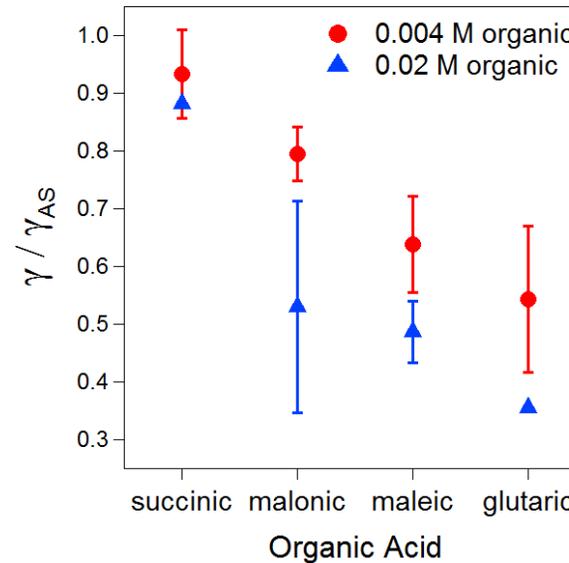
1. Microfluidic platform for *generating, manipulating, and trapping* of two phase systems.



2. Key results of current work (Metcalf et al., *Environ. Sci. Tech.*, 2016).



3. Measurements for a wide range of atmospheric aerosol mimics.



Preliminary Results:
Interfacial tension as a function of dicarboxylic acid – efforts to understand this functionality will inform ambient aerosol mixing state models.

4. Improve measurement platform to accept smaller volumes of liquid sample, allowing new avenues of study.

