A53L-2276 Investigating the Surface-Active Properties of Isoprene-Epoxydiol-Derived Methyltetrol Sulfates

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- *Hall B-C (Poster Hall) (Convention Center)*

Abstract

Secondary organic aerosols (SOA) are a major constituent of atmospheric fine particulate matter ($PM_{2.5}$). Previous field measurements readily detect SOA and believe they account for up to 70% of fine organic aerosols (OA) within our atmosphere. A source of SOA formation is is the photochemical oxidation of isoprene, resulting in the formation of compounds such as 2-methyltetrol sulfate (2-MTS). Previous studies have found that 2-MTS contribute significantly to chemical makeup of atmospheric isoprene-derived SOA, such as in field studies conducted in the Southeast USA and Amazon rainforest. Additionally, prior studies have suggested that 2-MTS are possibly surface active within $PM_{2.5}$. Despite its abundance in the atmosphere, little is known about the surface-active properties of 2-MTS. 2-MTS can further mix with atmospherically-relevant inorganic compounds, like ammonium sulfate (AS), which may further affect surface activity due to salting out effects. In this study, we investigate the surface activity of 2-MTS as well as 2-MTS/AS binary mixtures of various organic weight percentages (5%, 10%, 25%, 40%, 50%, 60%, 75%, 90%). These results from synthetically derived materials have atmospheric implications for the aerosol water-uptake and droplet formation that impact regional cloud formation and climate.

Plain-language Summary

In this work we make mixtures of compounds found in the atmosphere to understand how they influence droplet formation.

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