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NESL's Atmospheric Chemistry Division Seminar

Investigating Atmospheric Oxidation Chemistry with Switchable Reagent Chemical Ionization Mass Spectrometry

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Abstract

Despite rapid advances in analytical techniques applied to atmospheric chemistry, discrepancies in measurement-model comparisons still indicate that we lack a fundamental understanding of the atmospheric chemistry of some of the simplest molecules, such as formic acid. The problem is that a single hydrocarbon precursor undergoes a photochemical reaction cascade in which multiple oxidation products are produced over multiple generations - while a single oxidation product, such as formic acid, can be produced by many different precursor hydrocarbons. One approach to understanding this chemical complexity is to use high resolution mass spectrometers to simultaneously measure a vast array of molecules. We will discuss the application of a rapidly switching reagent chemical ionization mass spectrometer to field and laboratory measurements. We used this system to quantify formic acid and other organic acids during the Southern Oxidant and Aerosol Study in Alabama during the summer of 2013, and at the CalTech FIXCIT study in 2014. Our observations indicate that both the sources and the sinks of formic acid are strongly underestimated in models. Further, we will use observations from these studies to discuss both the pitfalls of quantitatively analyzing bulk atmospheric composition, and the potential for improving our understanding of atmospheric oxidation.

Monday, June 2nd

3:15 p.m. Refreshments

3:30 p.m. – Seminar

FL2-1022, Large Auditorium