

SEMINAR

Secondary Organic Aerosol Partitioning Chamber Experiments: A Fundamental Examination

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Abstract:

Secondary organic aerosols (SOA) have detrimental effects on human health and can influence the Earth's climate by altering radiative forcing. Their sources, fates, and chemical composition across the globe, however, remain poorly constrained. In this talk I will present new developments in the analysis of SOA field and laboratory experiments. First, the development of a method to accurately quantify the loss of gaseous compounds to the Teflon walls of environmental chambers using real-time measurements is presented. The method used short bursts of light to produce oxidants in situ, which in turn produced several gas-phase products with differing volatilities. Gas-phase products were observed in real time with a chemical ionization mass spectrometer (CIMS). The time scale of this process was short (< 700 s) enough to be on the order of other processes in SOA chamber experiments and is thus important enough to necessitate accounting for.

Second, I will describe how the same method was then applied to chamber experiments with liquid organic seed aerosol present to quantify the effect of gas-wall partitioning on aerosol mass yield experiments. A well-characterized simple chemical system is used to produce low volatility organic compounds at a rapid rate, which are taken up by liquid organic seed particles and/or the Teflon chamber walls. Both gas-phase products and aerosol concentrations are continuously monitored. A simple but comprehensive box model is used to quantify gas-particle partitioning and α . We discuss the implications for quantifying gas-particle partitioning under more complex conditions.

Date: Monday, February 6, 2017
Time: 3:15 p.m. refreshments; 3:30 p.m. seminar
FL2-1001, Small Auditorium

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