NCAR | ATMOSPHERIC CHEMISTRY OBSERVATIONS & MODELING

ACOM Seminar

Cyclic Volatile Methyl Siloxanes and their Oxidation Products – Atmospheric Marker of Humans? Status of Experiments, Field Sampling, and Modeling

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Date: Thursday, August 10th, 2023,11:00 am – 12:00 pm (MT)
Link: https://operations.ucar.edu/live-acom

ABSTRACT

Cyclic volatile methyl siloxanes (cVMS) such as decamethylcyclopentasiloxane are present in personal care and consumer products such as antiperspirants. Their environmental fate is mainly volatilization to air, followed by oxidation at time scales of approximately one week. OH oxidation is the primary pathway, followed by Cl oxidation and heterogeneous uptake/reaction on surfaces. cVMS has been studied for decades as a potential long-range transport organic pollutant. However, recently, the research focus has shifted to evaluating its role as a source of secondary aerosols, its role as an ozone precursor, its role as an indoor air pollutant, and its role as an anthropogenic marker compound. The shift is a result of laboratory, field, and model evaluation of its aerosol formation potential, and further by the growing realization of the importance of volatile chemical products, including personal care products, in atmospheric chemistry.

In the seminar, I will review the status of laboratory, field, and modeling studies from our own lab and from others on the product distribution, oxidation mechanism, representation in models, environmental loading, and aerosol formation capacity for this anthropogenic compound class.