

SEMINAR SERIES 2019 - 2020

SOUTHERN ONTARIO CENTRE FOR ATMOSPHERIC AEROSOL RESEARCH
UNIVERSITY OF TORONTO

NEW PERSPECTIVES ON SOURCES OF REACTIVE GAS-PHASE ORGANIC COMPOUNDS AND THE CHEMICAL COMPLEXITY OF SECONDARY ORGANIC AEROSOL

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Gas-phase organic compounds (including volatile organic compounds; VOCs) are key precursors to secondary organic aerosol (SOA) and tropospheric ozone. Through several bottom-up approaches, we evaluate the evolving role of non-combustion-related emissions in urban air quality, and demonstrate that non-combustion-related sources now contribute a major, but poorly-characterized fraction of SOA and ozone precursors from anthropogenic sources. We present an expanded framework for classifying volatile, intermediate, and semi-volatile emissions from this diverse array of sources that emphasizes a life cycle approach over longer timescales and multiple separate emission pathways. We also perform an extensive untargeted molecular-level intercomparison of SOA from three diverse field sites and an environmental chamber. Despite similar bulk composition, we report large molecular-level variability between multi-hour organic aerosol samples at each site, with 66% of compounds differing between consecutive samples. Through observations and model results, we evaluate the roles of emissions, chemical age, and oxidation conditions in driving this variability, and its potential implications.

Wednesday, July 24, 2019 3:00 - 4:00 PM

Wallberg Building, 200 College Street, Room 407



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