



CHEMISTRY DEPARTMENT SEMINAR



Contemporary Topics in Atmospheric Aerosol Chemistry and Air Quality

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The atmospheric chemistry research program in my lab at Laurier is motivated by the sustainable development goals on climate action, water, and partnerships. It aims to address some of the gaps in fundamental knowledge in aerosol chemistry and emerging scientific questions pertaining to air quality. One of the active research areas in atmospheric chemistry is the formation and aging of secondary organic aerosols (SOA), especially brown carbon, which refers to light absorbing soluble and insoluble components. In particular, the role of transition metals such as iron in catalyzing the formation of soluble and insoluble brown carbon in the presence of organics is still unclear. The major source of iron in aerosols is mineral dust, which undergoes aging due to reactions with acidic gases and organics. In the first part of this talk, results will be presented on (a) new pathways for efficient brown carbon formation from aqueous phase iron-catalyzed reactions with aromatic and aliphatic dicarboxylic acid compounds, and (b) ice and cloud nucleation efficiency of fresh versus reacted dust particles and insoluble SOA from iron chemistry. The significance of these results will be presented in relation to the chemical processing of iron-containing dust and how it changes dust optical and hygroscopic properties. The second part of my talk will highlight results from a pilot project on the use of low-cost air quality sensors to quantify emissions near schools in Kitchener, Ontario, Canada.

Research in the Environmental, Physical and Interfacial Chemistry (EPIC) Lab

The diagram illustrates the research areas of the EPIC Lab, organized into three main columns: Atmospheric Chemistry, Air Quality Monitoring, and Geochemistry. Below these columns is a section for Environmental Remediation. The diagram includes various scientific illustrations, diagrams, and book covers. At the bottom, there is a row of logos for various funding agencies and institutions.

Atmospheric Chemistry

Air Quality Monitoring

Geochemistry

Environmental Remediation

CO₂ → ATR-FTIR ←

Urea → MOF →

As, C, P, Fe

LANGMUIR

Environmental Science & Technology

EARTH SPACE CHEMISTRY

Environmental Science Atmospheres

Environmental Science Atmospheres

ATMOSPHERIC AEROSOL CHEMISTRY

INNOVATION.CA | FULBRIGHT CANADA | MS2 | imperial | CANADIAN INSTITUTE FOR SCIENCE AND TECHNOLOGY | RESEARCH COMMISSION ON SCIENCE AND INNOVATION | ACS | PRF | KITCHENER | NSERC | CSRSNG | Ontario

February 17th @ 2.00 p.m. – Lopez 106

Meeting ID: 955 4454 2732

<https://zoom.us/j/95544542732>