

## **High-Time Resolution Measurement of Particulate Matter Mass and Chemical Speciation**

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An equivalence study comparing data from an Aerosol Chemical Speciation Monitor (ACSM, Aerodyne) to other aerosol monitoring instruments was used to evaluate the performance of the ACSM. Positive Matrix Factorization (PMF) analysis with ACSM organics was also performed to identify sources of organics in an urban area. Particulate Matter (PM) was measured over the course of six months for a downtown region in Toronto Canada.

The chemical composition and mass fractions of PM including organics, nitrate, sulphate, ammonium, and chloride were determined by the ACSM. Mass concentrations measured from the ACSM showed good agreement with other aerosol monitoring instruments. Organic matter was found to be the largest contributor to particulate matter. Organic matter was categorized into three types: low-volatility oxygenated organic aerosol, semi-volatile oxygenated organic aerosol, and hydrocarbon-like organic aerosol. Low-volatility oxygenated organic aerosol accounted for just over half of the organic matter and showed no diurnal trends. But the other two types followed strong diurnal patterns and rush-hour peaks, indicating the direct contribution of vehicle emissions.