

# SEMINAR

**Investigating the atmospheric contribution of primary and secondary organic pollutants from mobile sources: a little bit of this (measurements) and a little bit of that (modeling)**

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Over the past two years, my research group in collaboration with a few others at Colorado State University has been studying gas and particle-phase organic pollutants from energy and combustion sources. In this talk, I will focus on our work on primary emissions, photochemical production, and atmospheric and environmental properties of organic aerosol (OA) and isocyanic acid (HNCO) from diesel engines. We have leveraged laboratory experiments, chemistry-thermodynamic models and chemical transport models to investigate the role of a suite of engine (e.g., load, fuel, aftertreatment) and atmospheric variables (e.g., dilution, photochemistry). During my talk, I will defend the following key findings:

(1) Gas/particle partitioning behavior of primary organic aerosol (POA) emissions from diesel engines is insensitive to engine load, fuel and aftertreatment and the reactive oxygen species potential (proxy for toxicity) of particle emissions from diesel engines is linked to the semi-volatile portion of POA.

(2) Photochemical production of secondary organic aerosol (SOA) from diesel exhaust is a factor of 10 higher than tailpipe emissions of POA at idle-like conditions, regardless of the presence of an aftertreatment system and the majority of the SOA mass can be linked to emissions of high molecular weight organic precursors that are typically not included in models.

(3) Diesel engines (but none of the aftertreatment systems) emit HNCO and precursors of HNCO and diesel sources are responsible for at least half of the HNCO found in urban environments (the other half might be from gasoline vehicles).

(4) Gasoline sources are the single most important source and single-ring aromatics found in gasoline fuel are the single most important precursor of OA in urban environments.

I will finish with a discussion on the uncertainties in my analysis and the implications for future work.

**Date: *Tuesday, November 15, 2016***  
**Time: 3:15 refreshments, 3:30 seminar**  
**FL2-1022, Large Auditorium**

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