

“Improving Chemical Mechanisms for Ozone and Secondary Organic Carbon”

CARB Research Seminar for Contract # 12-312

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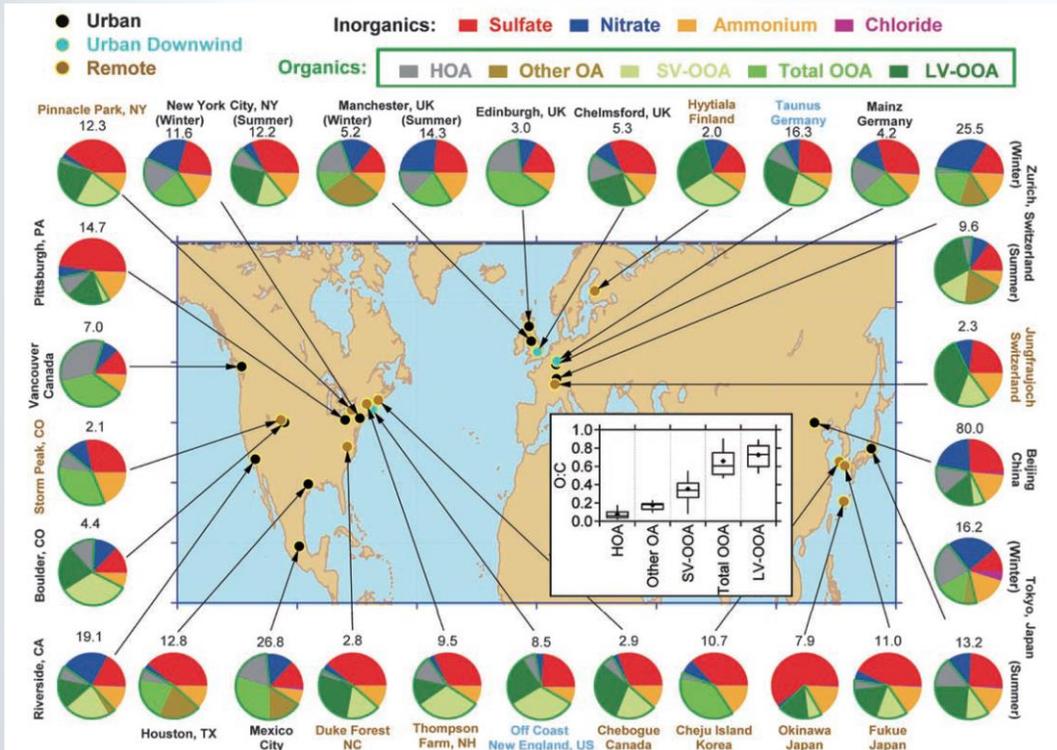
August 31, 2018

Announcements

- Additional information about the speaker as well as slides and other materials can be found at this link:
<https://www.arb.ca.gov/research/seminars/cappa/cappa.htm>
- For those of you online, questions for the speaker can be sent to sierrarm@calepa.ca.gov
- For our in-person audience: “housekeeping” items.

General Overview

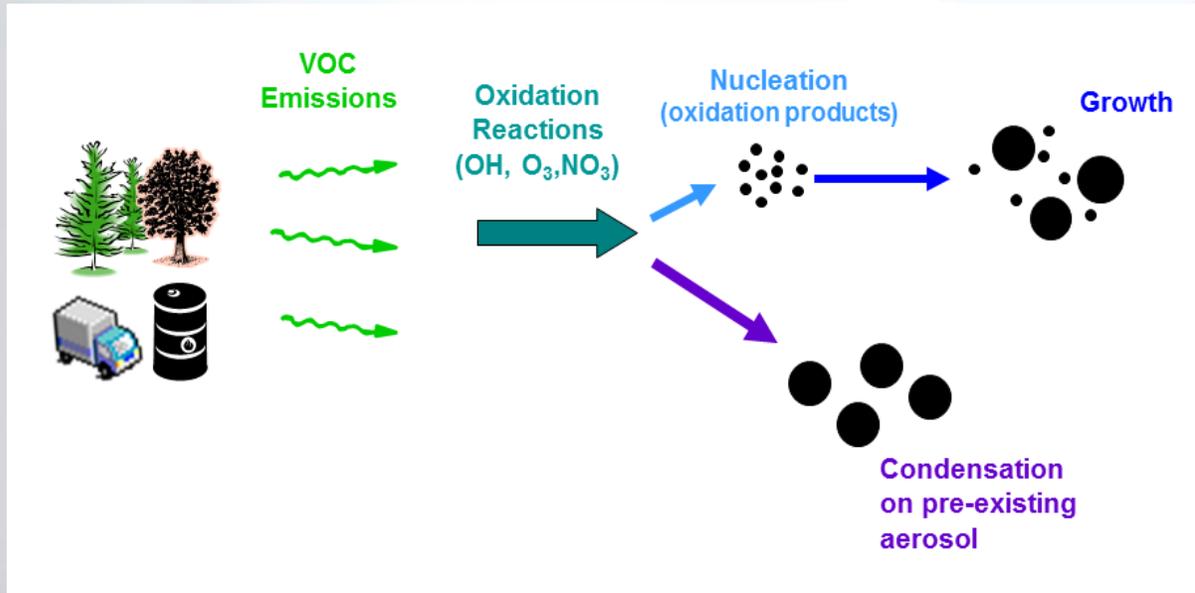
Jimenez et al., 2009



- PM_1 composition is based on the AMS field campaigns at many locations in the Northern Hemisphere.
- Primary OA (POA) is directly emitted from fossil fuel combustion and other urban sources.
- However, most OA mass at many locations is oxygenated organic aerosol (OOA).
- There is strong evidence that most atmospheric OOA is secondary.

- Regulatory efforts to comply with fine particulate matter ($PM_{2.5}$) standards require improvements in our knowledge of the factors controlling the concentration, size, and chemical composition of the $PM_{2.5}$.
 - Organic aerosols (OA) typically account for large fraction (20-70%) of the $PM_{2.5}$.
 - OA can be emitted directly from combustion sources or formed from gas species in the atmosphere, referred to as secondary organic aerosols (SOA).

Secondary Organic Aerosol (SOA)



Significance: As pollution controls reduce more primary emissions, higher SOA contributions are expected.

- ❑ SOA are formed in the atmosphere through oxidation/reaction of volatile organic compounds (VOCs) to form low-volatility products, which can form new particles or condense onto existing particles.
 - SOA are fraction of the total OA that can account for over 50% of the OA mass under certain conditions.
- ❑ Dominant sources of SOA precursors are gasoline and diesel vehicles, cooking, biomass burning, and regional biogenic emissions.

Today's Speaker — Dr. Christopher Cappa



- Dr. Cappa is a Professor and Vice Chair of the Civil and Environmental Engineering Department at the University of California, Davis.
- He received his Ph.D. from the University of California, Berkeley in Physical Chemistry in 2005.
- Research in the Prof. Cappa's group focuses on understanding and characterizing the processes that drive variations in the chemical, physical and optical properties of atmospheric aerosols, both through laboratory experiments and field observations.
- He is currently leading projects funded by NSF, the Department of Energy Atmospheric Systems Research Program, US EPA, and NOAA to develop clearer linkages between particle composition (including organic components) and optical properties.