

4UA.4

Fog Processing of Particulate Molecular Marker

Species. Jershon Eagar, Franz Ehrenhauser, Youliang Wang, James Hutchings, Aurelie Marcotte, Olivier Delhomme, Raghava Kommalapati, Mary Wornat, Kalliat Valsaraj, PIERRE HERCKES, *Arizona State University*

Fog and cloud processing of carbonaceous aerosol material can impact atmospheric concentrations of molecular species through scavenging, aqueous phase reactivity and/or depositional processes. In 2 recent field studies in Fresno (CA) and Davis (CA) the processing of organic species in particular so called molecular marker species, used in source apportionment studies was investigated. Pre- and post fog as well as interstitial aerosol samples were analyzed as well as the aqueous phase (fog) composition. Laboratory studies were conducted to investigate the reactivity of select species in the aqueous phase and identify reaction products and rate under common fog conditions.

Observational results show a differential scavenging of molecular marker species, suggesting selective scavenging of aerosols of some sources over of aerosols from different sources. The results and implications on atmospheric lifetimes will be discussed in detail. A relationship between scavenging efficiency and fog liquid water content, as suggested by earlier studies, could not be confirmed.

Laboratory studies on chrysene reactivity in fog conditions show a surprising diversity of reaction products and the results will be discussed relative to the field observations of the oxygenated daughter species.

4UA.5

Air Quality Impacts of a Scheduled 36-hour Closure of a Major Highway.

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On the July 16-17, 2011 weekend, a major Los Angeles highway, the I-405, was closed 36 hours for an overpass demolition. During this event we measured ultrafine particles (UFPs, < 0.1 micro-meters) and other air pollutants upwind, downwind, and at various distances of the I-405 pre-, during-, and post-closure using both fixed site and mobile platform monitors. We observed ~90% and ~40% traffic flow reductions on I-405 during closure on Saturday and Sunday, and ~20% reductions on the immediately adjacent Sepulveda Boulevard. During-closure downwind particle number concentration (PNC) decreased 73%, mass concentration (PM_{2.5}) decreased 44%, and black carbon (BC) decreased 48%. We found traffic density (vehicles distance) correlated well with downwind BC (R-square=0.71). Daily average particle size distributions downwind were bimodal with pronounced nucleation and accumulation mode peaks during non-closure conditions and unimodal with an accumulation mode peak during closure conditions on Saturday July 16. We compared our current data to a similar dataset from 2001 and found that, over this 10-year period, the downwind-to-upwind PNC ratio decreased ~40%, but weekday traffic flow increased ~20%. This translates into an ~50% PNC reduction per-vehicle from the I-405 transit corridor. We speculate this decrease may have been from reduction of sulfur content in diesel fuels (from 500 to 15 ppm in 2006), the increased California Low-Emission Vehicle standards, and retirement of older vehicles.

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