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AIRCRAFT FILTER MEASUREMENT OF AEROSOLS DURING A 1998 SUMMER PHOENIX FIELD EXPERIMENT

Y.-N. Lee, P. J. Klotz, S. R. Springston, L. J. Nunnermacker, R. Weber*,
P. H. Daum, and L. Newman
Environmental Chemistry Division, Brookhaven National Laboratory, Department of Applied Science, Environmental Chemistry Division, Upton, NY 11973-5000.

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Ambient aerosols were collected in parallel on two different filter media on board the DOE G-1 aircraft during an ozone and aerosol characterization experiment in Phoenix, Arizona between June 15 and July 11, 1998. One medium is a filter pack which consisted of a front quartz filter for aerosols and dual back NaCl impregnated cellulose filters for gaseous HNO_3, and the other is PTFE. The sampling period varied between 10 and 20 min. The filters were analyzed for Cl^-, NO_3^-, SO_4^{2-}, NH_4^+, and Ca^{2+} using an ion chromatograph. The respective median concentrations of these species were (in units of ug m^{-3}) 0.8, 3, 1.2, 0.6, and 2 for regions west of the urban area (normally upwind), and were 1, 5.5, 2, 0.8, and 4.5 for the urban area and regions to the east (normally downwind); these ionic species alone accounted for 14 ug m^{-3} in the urban area and its downwind regions. The roughly 3 to 1 NO_3^- to SO_4^{2-} ratio is consistent with the emission patterns of this region and with the results previously obtained from ground measurements. Comparison of the quartz and the Teflon filter samples showed that the agreement was the best for SO_4^{2-} (±15%), followed by NO_3^- and Cl^- (±25%).

*Current Address: Georgia Institute of Technology, Atlanta, GA.

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