

Characterization of Ambient Aerosols in Northern Mexico City with Single Particle Mass Spectrometry

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Continuous ambient measurements with Aerosol Time-of-Flight Mass Spectrometry (ATOFMS) were carried out in an industrial/residential section in the northern part of Mexico City as part of the Mexico City Metropolitan Area – 2006 campaign (MCMA-2006) between March 7 – 27, 2006. Biomass and organic carbon (OC) particle types were found to dominate the accumulation mode. Elemental carbon (EC) comprised a smaller fraction of the accumulation mode, and the majority of these particles were found to be internally mixed with sulfate. The supermicron particles were primarily composed of salt (NaKCl) and dust (Al/Si) types. Dust storms with strong winds from the east suggest that the major source of these particles is from a dry lake bed. At other times, the salt and dust particles did not show any dependence on wind direction, suggesting that fugitive sources of these inorganic aerosols are also important. Industrial emissions showed two unique metal particle types: Pb mixed with Zn and Pb without Zn; both types were internally mixed with Cl. The PbZn type was primarily submicron and mixed with carbon. Both metal types were correlated with winds from the southeast. A unique N-organic particle type was also detected and is hypothesized to be produced by industrial emissions based on the measured correlations with wind direction and the time series profile. All industrial emissions peaked in the early morning hours between 12 and 9am.