PARTICLE SIZE DISTRIBUTION OF NITRATE AND SULFATE IN THE MARINE ATMOSPHERE

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Abstract. Cascade impactor samples were collected at coastal sites on Sal Island, Barbados, and Virginia Key, Miami during 1974 and at two Miami coastal sites on Virginia Key and Key Biscayne during 1981. In all of the samples, the majority of the nitrate mass was found on intermediate size particles and exhibited a mass median diameter (MMD) of about 4 \( \mu \text{m} \). The ratio of the MMD of nitrate to that of sea-salt (about 7 \( \mu \text{m} \)) varied from 0.54 to 0.60 which indicates that the nitrate mass distribution is well defined by the surface area distribution of the sea-salt aerosols. This sharply contrasts with the distribution of non-sea-salt sulfate (also produced from gas-to-particle conversion reactions) which is present primarily on submicron aerosols. The lower levels of nitrate in the small particles are probably a consequence of the higher volatility and photochemical reactivity of the nitrate compounds expected to exist in the acidic aerosols.