

沙塵期間台北氣膠水溶性離子成份探討
Water-soluble Ions of Aerosols in Taipei during Dust Events

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Abstract

Dust originating from arid and semiarid areas in Central Asia can reach Taiwan during springtime. However, aerosols in a metropolitan area such as Taipei city also have significant local sources. In this work, the influence of long-range transport and local pollution on various water-soluble ions in the fine and coarse modes measured during several dust events were investigated. Concentration differences between dust-event and non-dust-event days were assessed. Field measurements were conducted in Taipei from February to May 2002. Twelve-hour samples of PM_{2.5} and PM₁₀ were taken. Water-soluble ions (Na⁺, NH₄⁺, K⁺, Mg²⁺, Ca²⁺, Cl⁻, NO₃⁻, and SO₄²⁻) were analyzed with ion chromatography. It was found that the mean concentrations of Na⁺, NH₄⁺, K⁺, Mg²⁺, Ca²⁺, Cl⁻, NO₃⁻, SO₄²⁻, and PM in the fine mode during the whole sampling campaign were 0.29, 2.87, 0.29, 0.029, 0.13, 0.57, 0.92, 2.68, and 28.2 微克/m³, respectively. The corresponding mean concentrations in the coarse mode (PM_{2.5-10}) were 0.75, 0.30, 0.096, 0.14, 0.63, 0.84, 2.33, 1.60, and 34.0 微克/m³, respectively. K⁺, Mg²⁺, and Ca²⁺ were increased about 1.7- to 3.8-folds; and Na⁺ and Cl⁻ showed about 45-210% increase on the dust-event days. On average, coarse NO₃⁻ and SO₄²⁻ showed a 67% and 97% increase, respectively, during the dust events.

Keywords: Asian dust, water-soluble ion, long-range transport, local pollution

關鍵詞：空氣污染，長程輸送，沙塵暴，水溶性離子