

Data for the manuscript: “A new method to quantify particulate sodium and potassium salts (nitrate, chloride, and sulfate) by thermal desorption aerosol mass spectrometry”

Yuya Kobayashi Tokyo Metropolitan University
Nobuyuki Takegawa Tokyo Metropolitan University

1. General

Laboratory experiments were performed to test the sensitivities of the refractory aerosol thermal desorption mass spectrometer (rTDMS) to various types of particles. The main test particles included single-component sodium nitrate (SN), sodium chloride (SC), sodium sulfate (SS), potassium nitrate (PN), potassium chloride (PC), and potassium sulfate (PS) particles, internally mixed multi-component SN/SC/SS and PN/PC/PS particles with a molar ratio of 1:1:1, and laboratory-generated sea salt particles. The particle generation system included a Collison atomizer (Model 3076, TSI, Inc.) and a differential mobility analyzer (DMA; Model 3080, TSI, Inc.). A condensation particle counter (CPC; Model 3022A, TSI, Inc.) and the rTDMS were connected downstream of the particle generation system. We set the mobility diameter at 200 nm to generate monodisperse particles. The data used for Figs. 2–6 in the main document are provided.

2. Data description

Fig. 2

ElapsedTime_mz23_SN: Elapsed time (s) since turning the laser on for ion signals at m/z 23 for SN particles
IonSignal_mz23_SN: Ion signals (A) at m/z 23 for SN particles

Fig. 3

MassLoading_SN_Na: Mass loading (ng) of Na for SN particles
IntegratedIonSignal_SN_mz23: Integrated ion signals (pC) at m/z 23 for SN particles

Fig. 4

ElapsedTime_mz23_SN+SC+SS_No.##: Elapsed time (s) since turning the laser on for ion signals at m/z 23 for internally-mixed SN+SC+SS particles (## represent the data ID)
IonSignal_mz23_SN+SC+SS_No.1: Ion signals (A) at m/z 23 for internally-mixed SN+SC+SS particles

Fig. 5

ElapsedTime_mz23_Seawater: Elapsed time (s) since turning the laser on for ion signals at m/z 23 for pure sea salt particles
IonSignal_mz23_Seawater: Ion signals (A) at m/z 23 for pure sea salt particles

Fig. 6

SN/SC_Solution: The ratio of SN to SC in the solutions

SN/SC_SeawaterParticle_mz30,36: The ratio of SN to SC in collected seawater + SN particles estimated using ion signals at m/z 30 and 36

SN/SC_AuthenticParticle_mz30,36: The ratio of SN to SC in collected authentic SC + SN particles estimated using ion signals at m/z 30 and 36