

Mixing states of summer time aerosol particles in Noto peninsula

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Mixing state is one of the factors that determine the characteristic of aerosol particles, and it is important for evaluating their climatic impact. Until recently, summer time aerosol particles in the remote region of central Japan didn't attract much attention since human influence was considered minimal during the season. However, our measurement in the last few years showed that particle number concentrations in summer time were the highest in all seasons. In order to understand the characteristics of the summer time aerosols, we analyzed composition and mixing state of individual particles using transmission electron microscopy (TEM) coupled to energy dispersive W-ray spectrometer (EDX). We conducted quasi-daily sampling at research facility NOTOGRO (NOTO Ground-based Research Observatory) situated at tip of the Noto peninsula from 9th, Jun to 23rd, August. Samples collected during episodes of high aerosol loadings were selected and analyzed. Winds tend to transport air-mass from the Pacific Ocean to the sampling site in summer. However, we found that there were some other flow patterns including flow from the continent of Asia, associated with the high aerosol concentrations. Major composition of particles differed depending on the flow patterns. In addition, many particles were internally mixed, and organics were predominant in smaller diameter range, while sulfates were predominant in larger diameter range. Above results showed that, depending e.g. on the difference of the flow patterns, mixing state of aerosols observed in high concentrations in summer exhibit high temporal variability, and such mixing state are often unevenly distributed among different particle sizes.

Keywords: atmospheric aerosols, mixing state, organic aerosol particles, sulfate aerosol particles