



Analyses of salt particles included in the Dome Fuji ice core by using scanning electron microscope combined with Raman spectrometer

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Very recently, micro-inclusions of acid salts were found in the Dome Fuji ice core, as major chemical forms of tracer ions (Ohno et al., 2005). Although simple salts such as $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$, $\text{MgSO}_4 \cdot 12\text{H}_2\text{O}$ and $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ were identified by the micro-Raman spectrometer, some complex salts cannot be identified.

In contrast, scanning electron microscope (SEM) and energy dispersive X-ray spectroscopy (EDS) analysis has been used to obtain the appearance, location and atomic compositions of impurities in ice cores (for example, Baker et al., 2003 and Barnes et al., 2003). Although the constituent elements of a target particle are easily identified by the X-ray spectra, chemical forms of the substance cannot be determined.

In the present study, a newly developed SEM/EDS combined with Raman spectrometer, SEM-Raman, was used to identify chemical forms of the micro-particles. Since both EDS and Raman spectra can be measured on the same stage, information of the constituent elements and molecular bonding can be obtained simultaneously. Here we will present recent results on salts particles in Dome Fuji ice core by using this new apparatus.

References:

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