

## Salt inclusions in ice cores during the LGM/Holocene transition- Chemical compositions of aerosols related to climate change -

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The ion chromatography of polar ice cores is well established as a method to reconstruct paleoatmosphere. However, original substances transferred into ice from aerosols are missing because melting of ice is needed by the method. We have found recently by using micro-Raman spectroscopy that the most of the major ions are included in water-soluble micro particles composed of sulfate salts, nitrate salts and methanesulfonate salts. In addition, we also found the compositions of these salts depend on climate; especially the composition at LGM is completely different from those in Holocene and other climate periods. These findings imply that the past aerosols are preserved in ice. In contrast, we also found that significant amount of sulfate salts are formed in firn after deposition of aerosols on the top surface of ice sheets during the Holocene period. Although we have to take the chemical-physical process in firn into consideration, we can derive unique data on the chemical forms of the past aerosols. In the present study, we aim to clarify the difference in chemical compositions of salt particles included in the Dome Fuji ice core and GRIP ice core among LGM, Termination-I and Holocene.

Our findings show about Dome Fuji ice core that almost all of salts were sodium sulfate and magnesium sulfate during beginning of Termination I to Holocene. Various kinds of salts mainly calcium sulfate were found during LGM to beginning of Termination I. It has been considered that Calcium is the origin of continental dust and sulfate origin is oxidation of MSA. These results suggest that sulfate reacted to calcium in the atmosphere or calcium sulfate were already composed by continental origin during beginning of Termination I and LGM.

Reference; H. Ohno et al., EPSL 232 (2005), 171-178.

Y. Iizuka et al., Journal of Glaciology in press.

