

## BEHAVIOR OF CHEMICAL SUBSTANCES IN THE SURFACE SNOW IN THE DOME FUJI AREA (ABSTRACT)

Kazuki NAKAMURA<sup>1</sup>, Yutaka AGETA<sup>1</sup>, Masayoshi NAKAWO<sup>1</sup>  
and Kumiko GOTO-AZUMA<sup>2</sup>

<sup>1</sup>*Institute for Hydrospheric-Atmospheric Sciences, Nagoya  
University, Furo-cho, Chikusa-ku, Nagoya 464-01*

<sup>2</sup>*Nagaoka Institute of Snow and Ice Studies, National Research  
Institute for Earth Science and Disaster Prevention,  
Science and Technology Agency, 187-16, Maeyama,  
Suyoshi-cho, Nagaoka 940*

For ice core analysis, it is important to understand how chemical substances are preserved in glaciers. We have tried to make clear how the record of chemical substances (main anions:  $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$  and  $\text{Cl}^-$ ) is preserved during the surface snow to firn transition in high altitude, East Antarctica. Chemical analyses and the measurement of density and size of snow crystals at every 1 cm interval in depth have been carried out with a shallow pit sample in the Dome Fuji area ( $77.7^\circ\text{S}$ ,  $39.1^\circ\text{E}$ ), East Antarctica, where a deep ice core will be retrieved in the near future. This sample was taken by the 33th Japanese Antarctic Research Expedition in 1992.

We have estimated the mass of sublimated parts of snow crystals at every 1 cm interval in depth from snow crystal size during the growth of snow crystals in the surface layer at shallow depths. And we have compared  $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$  and  $\text{Cl}^-$  concentrations with the mass, density,  $\text{Na}^+$  concentration,  $\delta^{18}\text{O}$  and so on.

The concentration of  $\text{NO}_3^-$  was found to have decreased rapidly with depth in the surface layer at shallow depths. It seems that  $\text{NO}_3^-$  contained in the sublimated parts of snow crystals is emitted to the atmosphere as gas (e.g. as  $\text{HNO}_3$ ) during the growth of snow crystals. Seasonal variations in the concentration of  $\text{SO}_4^{2-}$  were found at all depths we have analyzed (0–1.4 m, 8–10 m). And the average concentration of  $\text{SO}_4^{2-}$  in the shallow part (0–1.4 m) is almost equal to that in the deep part (8–10 m).  $\text{SO}_4^{2-}$  seems to be preserved during the surface snow to firn transition. The average concentration of  $\text{Cl}^-$  in the shallow part is almost equal to that in the deep part too. Seasonal variations in the concentration of  $\text{Cl}^-$  were found in the shallow part too, but those were not found in the deep part. We cannot now judge whether  $\text{Cl}^-$  is preserved during the surface snow to firn transition or not. We expect new results about  $\text{Cl}^-$  from new samples.

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