

ドームふじで採取された DF01 浅層コアの化学組成の概要と Na⁺及び Cl⁻イオン分布についての考察

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Overview of chemical composition and the characteristics of the distributions of Na⁺ and Cl⁻ in shallow ice core samples from DF01 core (Antarctica) drilled in 2001

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Ice core samples records information on the geological history of the Earth, including past climate changes. Dome Fuji, situated at the highest point of land in central Antarctica, is considered one of the best drilling locations for procuring samples in order to reconstruct past climates and environments. We present here fundamental data on the concentrations of dissolved ions in shallow ice core samples from depths between 7.7 m and 65.0 m at the Dome Fuji core drilled in 2001. The measured anions were HCOO⁻, CH₃COO⁻, CH₃SO₃⁻, F⁻, Cl⁻, NO₂⁻, NO₃⁻, SO₄²⁻, C₂O₄²⁻, and PO₄³⁻, and the cations were Na⁺, K⁺, Mg²⁺, Ca²⁺, and NH₄⁺. The temporal resolution of the depth profiles of the ion concentrations was less than one year. No significant correlations were observed among the ions except for Na⁺, and Cl⁻. The ion balance in the core based on the averaged ion concentrations of the samples, was different to that of sea salt, a result consistent with the findings of previous studies. In several samples, however, synchronous concentration peaks of Cl⁻ and Na⁺ were identified among which the Cl⁻/Na⁺ ratios of these samples were close to that of sea salt. This observation indicates the possibility that climate conditions were such that precipitation containing sea salt fell in the Dome Fuji area. The Na⁺/Cl⁻ ratio of samples which did not exhibit Na⁺ and Cl⁻ peaks in the depth profile, differed from that previously reported for the covering snow. This implies that the re-distribution of Cl⁻ due to high concentration of sulphate occurred after the precipitation. To interpret these observations, further studies such as isotopic analyses of δD and δ¹⁸O to elucidate climatic condition are required.