

IDENTIFICATION OF ANNUAL LAYERS BY CHEMICAL ANALYSES WITH A 10 M DC CORE (ABSTRACT)

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For dating an ice core, identification of annual layers is of great importance. Dating is usually examined by detecting seasonal cycles of concentration of chemical components along the core. Chemical analyses have been carried out with a 10 m-long shallow core of Dome Camp (77.0°S, 35.0°E) sampled by JARE-26 in December 1985, to see the potential use of this method for a deep ice core to be retrieved in the near future near the camp, East Antarctica.

We have analyzed, with an ion chromatograph, Cl^- , NO_3^- and SO_4^{2-} concentrations for small "disk" samples cut horizontally at every 1cm interval in depth so that 8 or 9 successive samples will cover an annual layer, because the accumulation rate has been estimated to be 9.2 cm/year (snow) as an average for the last few decades at Dome Camp.

Periodic variations were found in the concentration profiles of both Cl^- and SO_4^{2-} . The period of the latter was found to be close to 9 cm. Hence SO_4^{2-} could be a good indicator of annual layers for core samples near the dome, although care has to be taken for volcanic events which would have an enormous effect on SO_4^{2-} concentration. The period of the variation of Cl^- concentration, however, was much longer than the thickness of an annual layer. The concentration of NO_3^- was found to have decreased rapidly with depth, which seems to indicate a discernible loss of NO_3^- during the growth of snow crystals in the surface layer at shallow depths.

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