

DIELECTRIC PROPERTIES OF DEEP ICE CORES WITH AIR-HYDRATE INCLUSIONS

(Abstract)

by

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ABSTRACT

Air-hydrate inclusions have been found in deep ice cores from Dye 3, Greenland, which were taken in August 1981. Although the concentration of the air-hydrate crystals decreased with time, when the core was stored at a temperature of -50°C , they still existed to an appreciable extent in 1985.

An ice specimen was cut out from the Dye 3 core at a depth of 1500 m, where the volume fraction of the hydrate crystals was about 10^{-3} by volume. Its dielectric

properties were measured in September 1985, in a frequency range of $30\text{--}20 \times 10^3$ Hz and temperature range of -20° to -90°C . The activation energy obtained for the relaxation time of the Debye dispersion was about 0.2 eV, which is much smaller than that of pure ice.

The measurement was repeated once a month for about a year, and the sample was stored at a temperature of -10°C between measurements. The time variation of the dielectric properties has been discussed in relation to the deterioration of the air-hydrate crystals.