

## EVAPORATION OF SNOW CRYSTALS AND SNOWFLAKES (ABSTRACT)

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Experiments to evaporate natural snow crystals and snowflakes under a polarization microscope were carried out at Sapporo in 1987. Evaporation of snow crystals and snowflakes occurred preferentially at pointed ends and shapes of evaporating crystals were similar to their growth forms although their pointed ends had rather rounded surfaces. However, the following two kinds of phenomena were also observed when dendrites, rimed plates and irregular poly-crystals were evaporated at  $-3 \sim -9^{\circ}\text{C}$ . (1) Fracture: fractures of pointed ends. Fractured parts were folded, moved intermittently or rotated on the surfaces of mother crystals. (2) Fragmentation: fractured parts were frequently ejected as fragments.

Laboratory experiments to evaporate artificial snow crystals at temperatures between  $-0.5$  and  $-12^{\circ}\text{C}$  and at relative humidities between 40 and 97% were also carried out in order to confirm the occurrence of these phenomena. In the case of needles it was found that not only fractures and fragmentations but also deformations to form curled pointed tips occurred at relative humidities between about 55 and 85%.

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## SPATIAL DISTRIBUTION OF AEROSOL-STATE METHANESULFONIC ACID OVER THE ANTARCTIC OCEAN (ABSTRACT)

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During the austral summer of 15 November 1986 to 3 March 1987, bulk aerosol sampling by Andersen high-volume sampler was carried out on board the icebreaker SHIRASE in her relief voyage of the 28th Japanese Antarctic Research Expedition to Syowa Station, Antarctica. The aerosol samples were collected on Toyo Roshi GB100R as impaction surfaces at air flow rates of about 566 l/min. These filters were changed at intervals of four days. The collected samples were analyzed by an ion chromatograph (column: TSK gel IC-Anion-PW) to examine the concentrations of methanesulfonic acid (MSA:  $\text{CH}_3\text{SO}_3\text{H}$ ) as an oxidation product of dimethyl sulfide (DMS:  $\text{CH}_3\text{SCH}_3$ ) in the formation of sulfuric acid aerosols.

Methanesulfonate ( $\text{CH}_3\text{SO}_3^-$ ) concentrations ranged from the value beyond the detection limit (10 ppb) to  $0.067 \mu\text{g}/\text{m}^3$ . The increases in the concentrations near the Antarctica suggested that DMS was produced actively by marine algae near the Antarctic coastal regions with high primary productivity. Methanesulfonate concentrations in marine aerosols above the 50%