

An experiment was carried out for the 22° halo. As a result, we showed that the artificial formation of halo with enough intensity was possible and the effects of the variety of crystal forms and crystal size for halo formation were extremely severe. On the basis of these experimental results and theoretical consideration, we discuss the formation mechanism of the "halo". Finally, we mention important applications of halo study such as remote sensing of cloud particles from the ground or a satellite.

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CHEMICAL NATURE OF HEAVY METAL ELEMENTS IN ANTARCTIC SNOW (ABSTRACT)

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Analysis of firn block samples from site S25 near Syowa Station revealed that significant parts of Al, Fe, Zn and Cu are contained in the snow sample as organic metal compounds. They dissolve into the melt water of the snow sample and become reactive only after oxidative digestion with HClO₄ and HNO₃.

The same organic metal compounds were found in atmospheric aerosols collected at Syowa Station and Mizuho Station, which suggests that these were incorporated into the snow from atmospheric aerosols.

The above observation, in association with the finding that these organic metal compounds also exist in aerosols from the North Pacific as well as from the Southern Sea, indicates that these compounds are widely distributed in the global atmosphere and further suggests the existence of gaseous organic metal compounds in the air as a precursor of these compounds in the aerosols.

The samples of snow from site S25 and atmospheric aerosols from the Southern Sea were subjected to volatilization experiments in the vacuum and the vapor was collected in the cold trap immersed into the liquid N₂. Significant amounts of the heavy metals were found in the cold trap, showing the volatile nature of these heavy metal elements contained in the Antarctic snow and aerosols. These results support the idea that the gaseous organic metal compounds exist in the air as a precursor of aerosols. Experiments to directly determine the gaseous organic metal compounds are now in progress.

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