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CHEMICAL COMPOSITIONS OF SEA SALT PARTICLES AND PARTICULATE SULFUR COMPONENTS AT SYOWA STATION, ANTARCTICA (ABSTRACT)

Keiichiro HARA[1]*, Tadashi KIKUCHI[1], Keiichi FURUYA[1], Masahiko HAYASHI[2], Yoshiyuki FUJII[3] and Yasunobu IWASAKA[2]

[1]*Department of Applied Chemistry, Faculty of Science, Science University of Tokyo, 1–3, Kagurazaka, Shinjuku-ku, Tokyo 162*
[2]*Solar Terrestrial Environment Laboratory, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-01*
[3]*National Institute of Polar Research, 9–10, Kaga 1-chome, Itabashi-ku, Tokyo 173*

Atmospheric aerosol particles were collected every month with a high volume air sampler (CPS-105, Kimoto Elec. Ind. Inc.) at Syowa Station, Antarctica (69°00' S, 39°35' E) in 1991. The morphology of individual aerosol particles (0.7–5.4 μm) and the compositions were investigated with scanning electron microscopy– Energy dispersive X-ray analysis (SEM-EDX; S-5000 Hitachi) and laser microprobe mass spectrometry (LAMMS; LAMMA-1000 Leybold-Heraeus). About 180 and 4800 particles were analyzed in SEM-EDX and LAMMS, respectively. The ratio of the modified sea salt particles increased with intensity of solar radiation. Most sea salt particles in the polar night (June) were not modified, and in summer (December) most of them were modified with sulfuric acid and methanesulfunic acid (MSA). Seasonal variation of sulfur components (sulfuric acid and MSA) showed good correlation with intensity of solar radiation. In spring, about 55% of sea salt particles contained sulfuric acid and/or MSA. In summer, however, only a few percent of sea salt particles contained those sulfur compounds; most sulfur compounds were found in the particles which were different type particles from the sea salt.

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*Present address: Solar Terrestrial Environment Laboratory, Nagoya University, Furo-cho, Chikusa-ku, Nagoya, 464-01.