

ATMOSPHERIC CONCENTRATIONS OF HALOCARBONS AND METHANE IN ANTARCTICA (Abstract)

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Atmospheric concentrations of halocarbons (CCl_2F_2 , CCl_3F and CH_3CCl_3) and methane (CH_4) in Antarctica were measured and compared with those observed in the Northern Hemisphere (N.H.). These compounds are all related to the depletion of ozone in the stratosphere and the green-house effect. Air samples were collected in preevacuated all-stainless steel canisters at 500–1000 m NE (upwind direction) of Syowa Station in January–February of 1981–1983, and analyzed after 3–4 months at the University of Tokyo by EC gas chromatography (for halocarbons) and by FID gas chromatography (for methane). The observed concentrations of CCl_2F_2 and CCl_3F in Antarctica were 331 and 177 pptv (pptv = 10^{-12} v/v), respectively, in 1983, which were 10 and 11% lower than the background concentrations we observed in the mid-latitude N.H. (Hokkaido). Such a difference can be explained in terms of their predominant emissions in the N.H. and extremely long lifetimes in the troposphere (>50 years). The concentration of CH_3CCl_3 was 30% lower in Antarctica indicating a tropospheric lifetime of 6–7 years. The methane concentration was 1.56 ppmv (ppmv = 10^{-6} v/v) in Antarctica and about 10% lower than in Hokkaido; this may provide information on the source and behavior of atmospheric methane which are not fully understood.

(Received April 6, 1984)

IN SITU MEASUREMENTS OF MOLECULAR FORM OF STRATOSPHERIC SULFATE PARTICLES (Abstract)

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As part of scientific activities on MAP in Japan, direct sampling and analysis of trace species and aerosols in the lower stratosphere using a Merlin-IV aircraft has been planned.

In stratospheric aerosol sampling, we concentrated on obtaining the molecular form of sulfate particles by using a vapor-deposited thin film of calcium as a reactive particle collected surface. Chemical testing by the thin calcium film is a specific test for the detection of the sulfuric acid component in individual submicron particles under low ambient relative humidities (A. ONO *et al.*: *Tellus*, **35B**, 197, 1983).

On February 20, 1983, Merlin-IV sampled aerosols in the lower stratosphere at an altitude of 8.3 km over the Sea of Japan (40°N/137°E). It was observed that almost all particles etched a thin calcium film and formed reaction spots spread around the original particles. This indicates clearly that dominant