

INFRARED AND UV-VISIBLE ABSORPTION MEASUREMENT AT SYOWA STATION (ABSTRACT)

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Vertical column contents of some trace gases were observed by solar infrared and UV-visible absorption techniques at Syowa Station, to study the dynamics and chemistry of Antarctic ozone.

HCl, HF, N₂O, OCS, CO and C₂H₆ column contents were measured by infrared absorption spectroscopy in the 3–5 μm region with a resolution of 0.09 cm⁻¹–0.06 cm⁻¹. The measurements were carried out from July to December in 1991.

O₃, NO₂, OClO and BrO column contents were measured by UV-visible absorption spectroscopy in the 300–420 nm region with a resolution of 0.4 nm. The measurements were carried out from May 1991 to January 1992.

Observed HCl and HF vertical column contents imply that stratospheric HCl was removed in winter by heterogeneous reactions. HCl vertical column contents were found to be 1–2×10¹⁵ cm⁻² in winter, increasing to 8–12×10¹⁵ cm⁻² as the ozone hole collapsed in summer. However, HF vertical column contents remained fairly constant at 1–2×10¹⁵ cm⁻² during the observation period. Both summer HCl column contents and HF column contents are consistent with the model expectation for unperturbed air at 70°S, while winter HCl column contents are significantly low, suggesting that only HCl was removed by heterogeneous reactions.

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