

westerlies, higher temperatures and higher ozone mixing ratios at high latitudes. It is possible that the long term change in the lower stratosphere are also related to the long-term trend in wave activity, although the evidence is not clear. Because the wave activity in 1979 was very vigorous, a simple comparison of atmospheric states between the 1979 and other recent years could lead to misleading conclusions on the rate of ozone decrease over the Antarctic. A long-term chemical effect is not precluded.

(Received January 27, 1987)

HETEROGENEOUS REACTIONS RELATED TO ANTARCTIC OZONE HOLE (ABSTRACT)

Shiro HATAKEYAMA¹ and Ming-Taun LEU²

¹*National Institute for Environmental Studies, Yatabe-machi,
Tsukuba-gun, Ibaraki 305*

²*Jet Propulsion Laboratory, California Institute of
Technology, Pasadena, CA 91109, U.S.A.*

Reactions of chlorine nitrate (ClONO₂) with HCl and H₂O have been investigated using a 320-L Pyrex chamber and long-path FT-IR spectroscopy. Both reactions showed highly heterogeneous nature. Obtained upper limit rate constants for homogeneous reactions were 8.4×10^{-21} and 3.4×10^{-21} cm³ molec⁻¹ s⁻¹ for ClONO₂+HCl and ClONO₂+H₂O, respectively, at 296 ± 2 K at 730 torr total pressure. The yield of HNO₃ from both the reactions was 1.05 ± 0.09 and 0.86 ± 0.08 , respectively. Formation of HOCl was confirmed in the latter reaction. No synergistic effect between HCl and H₂O was observed for the reaction with ClONO₂. The kinetic behavior of the reaction ClONO₂+H₂O was well described by simple first-order kinetics while the behavior of the reaction ClONO₂+HCl was found to obey the Langmuir adsorption isotherm.

(Received December 26, 1986)

ATMOSPHERIC CARBON DIOXIDE CONCENTRATION AT SYOWA STATION (69°00'S, 39°35'E), ANTARCTICA (1985) (ABSTRACT)

Haruta MURAYAMA¹, Masayuki TANAKA², Takakiyo NAKAZAWA²,
Sadao KAWAGUCHI³, Takashi YAMANOUCHI³, Shuji AOKI³
and Masataka SHIOBARA⁴

¹*Department of Chemistry, Faculty of Education, Yokohama National
University, 156, Tokiwadai, Hodogaya-ku, Yokohama 240*

²*Upper Atmosphere Research Laboratory, Faculty of Science, Tohoku
University, Aramaki Aoba, Sendai 980*

³*National Institute of Polar Research, 9-10, Kaga 1-chome,
Itabashi-ku, Tokyo 173*

⁴*Meteorological Research Institute, 1-1, Nagamine,
Yatabe-machi, Tsukuba-gun, Ibaraki 305*

Since 1984, continuous measurements of the atmospheric CO₂ concentration have been carried out at Syowa Station, Antarctica. Preliminary inspection of the data showed that; (1) a regular