

## C-1 Studies on the Behavior of Acidic and Oxidative Component in East Asia

**Contact Person** Kentaro Murano  
Senior Research Scientist, Acid Deposition Research Team  
Global Environment Division, National Institute for  
Environmental Studies  
Environmental Agency  
16-2, Onogawa, Tsukuba, Ibaraki 305 Japan  
Phone: +81-298-51-6111(Ext. 437) Fax: +81-298-51-4732

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In order to clarify the behavior of atmospheric pollutants, observation of atmospheric pollutants had been carried out at several places where the air pollutants from Asian continent may reach. Back trajectory analysis of air from Oki Is. showed that the contribution from Asian continent were 70-80% in winter, while it was 50-60% and 30-40% in the spring and summer, respectively. The long term record of particulate non-sea salt sulfate concentrations showed nearly 5% increase. The main contributor of inorganic ion of particulate matter on Happo-one is sulfate. The deposition of non-sea salt sulfate on Happo-one is twice as much of that in urban Nagano city.

Experimentally, the probable error of pH measurement could be as high as 0.1 pH unit because of varying characteristics of pH electrode. The self-consistent least-mean square method was applied to a data set for Iwamizawa site to find three major sources affected the precipitation chemistry and chemical composition of these source materials were : 1) sulfate and nitrate salts of calcium and ammonium, 2) sea-salt, and 3) partially neutralized acids.

Objectives of the observation were to elucidate the dynamics of atmospheric trace components by three-dimensional observation of atmospheric pollutants around Japan and to clarify the processes of transformation and deposition of pollutants. The results of 1992 flights are more interesting. On Nov. 11 south wind blew. High concentration of SO<sub>2</sub> was observed near Honshu rather sharply. In contrast, on Nov. 12, very high concentration of SO<sub>2</sub> was monitored above Sea of Japan. On this day wind blew from west or north-west. The concentration of SO<sub>2</sub> came down when the airplane approached to Honshu. Distribution of NO<sub>x</sub> was similar to SO<sub>2</sub>. It indicates that there is a very strong influence of continental air mass to Japan when wind blows from west or north-west. Formation mechanism of hydrogen peroxide and organic peroxides in ozone-natural hydrocarbon reactions were established.

To clarify the transport process of pollutants related with acid precipitation in the east Asia, the long-range transport model is developed. The result of numerical simulation showed that the annual wet deposition in Japan originated in the emission in vicinal countries was 0.1-0.3 g/m<sup>2</sup>. The calculated sulfate wet deposition was one order lower than that observed.

The reliable methods of sampling and carrying, and keeping for atmospheric PANs are developed for field studies at remote sites and by aircraft. The decay rate of PANs in the chilled trap is below 1.5%/day, and the sublimation rate of dry ice is less than 15%/day in the plastic box thick walls. PAN and PPN were detected in most of the samples. A good correlation between them was observed and PPN is 5-9% of PAN. The concentrations of PAN and PPN were 0.02-0.8 ppb and 0.002-0.056 ppb, respectively, in Tushima Is.