Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

AAS22-P18 会場:3 階ポスター会場 時間:5 月 1 日 18:15-19:30

能登半島珠洲における PANs および有機硝酸エステルの季節変動
Seasonal variations of peroxyacyl nitrates and alkyl nitrates concentration at Suzu, the Noto Peninsula

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NO_x emissions have been increasing in East Asia with recent remarkable economic progress. NO_x has relatively short lifetime and NO_x concentrations are governed by local NO_x emissions. On the other hand, descendant photochemical products of NO_x such as $T.NO_3$ (the sum of gaseous nitric acid and particulate nitrates), PANs (peroxyacyl nitrates) and ANs (alkyl nitrates) have longer lifetime than NO_x, so that they can be transported over a long-distance. In order to understand influences of the cross-border pollution, it is important to clarify the long-range transport of $T.NO_3$, PANs, and ANs.

We have been continuously observing several pollutants at NOTOGRO (Noto Ground-based Research Observatory) supersite in Suzu, the Noto Peninsula. NOTOGRO is located at 37.45N and 137.36E. NO_x were determined by an LED photolytic converter / NO-O_3 chemiluminescence method. NO_y and $T.NO_3$ were observed by a scrubber difference / NO-O_3 chemiluminescence method. CO was monitored by a non-dispersive infrared photometer. PANs and ANs were measured by a thermal dissociation / cavity attenuated phase shift spectroscopy method.

In this presentation, observational results and discussion from December, 2012 to July, 2013 are described, focusing on seasonal variations of PANs and ANs. The air mass origins arriving at Suzu were classified into the following four groups, Russia and North China (RC), Korea and Middle China (KC) and Japan (JP) and Sea (S) using backward trajectory analyses. From winter to spring, both PANs and ANs concentrations from KC were higher than those from the other air mass origins. From spring to summer, their concentrations were independent of air mass origins.

From winter to spring, the lifetimes of PANs and ANs are long because of low temperature and weak solar radiation. In addition, their in-situ photochemical generation rates are low, so that PANs and ANs concentrations in this season are governed by long-range transport. From spring to summer, the lifetimes of PANs and ANs become shorter and their photochemical production rates become higher, that is, local photochemical productions of PANs and ANs are relatively important. Diurnal variations of PANs and ANs also support these concentration variation factors. From winter to spring, no diurnal variations were observed. Meanwhile, PANs and ANs concentrations began to be higher and lower in the daytime and nighttime, respectively, from spring to summer.

キーワード: パーオキシアシルナイトレイトおよび有機硝酸エステル, 長距離輸送, 季節変動
Keywords: peroxyacyl nitrates and alkyl nitrates, long-range transport, seasonal variation