

[EJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-AS Atmospheric Sciences, Meteorology & Atmospheric Environment

## [A-AS06] Atmospheric Chemistry

convener: Yoko Iwamoto (Graduate School of Biosphere Science, Hiroshima University), Tomoki Nakayama (Graduate School of Fisheries and Environmental Sciences, Nagasaki University), Sakae Toyoda (東京工業大学物質理工学院, 共同), Nawo Eguchi (Kyushu University)

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

This session provides a forum for the presentation of the broad spectrum of tropospheric and stratospheric chemistry, including various research topics (e.g., dynamical processes, air quality and climate), approaches (modeling, field measurements, remote sensing, and laboratory studies), and species (gas and aerosol). This session also provides an opportunity for discussing possible future collaboration with other research fields relevant to atmospheric chemistry.

## [AAS06-P15] Seasonal variations of triple oxygen isotopes of atmospheric nitrate and sulfate at Noto Peninsula, Japan

\*Shohei Hattori<sup>1</sup>, Atsushi Matsuki<sup>2</sup>, Kazuki Kamezaki<sup>1</sup>, Naohiro Yoshida<sup>1,3</sup> (1. Department of Chemical Science and Engineering, School of Materials and Chemical Technology, Tokyo Institute of Technology, 2. Institute of Nature and Environmental Technology, Kanazawa University, 3. Earth-Life Science Institute)

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Anthropogenic activities have increased emissions of nitrogen and sulfur from land to the atmosphere. By recent increase of the anthropogenic pollutants in the atmosphere, atmospheric oxidative capacity can be changed in the east Asia. An understanding of changes in the oxidizing capacity of the atmosphere is also relevant for air quality managers, but it is not easy because of oxidant's unstabilities and multiple competing effects. The magnitude of  $^{17}\text{O}$  enrichment ( $\Delta^{17}\text{O}$ ) in atmospheric nitrate and sulfate are unique tracers for the apportionment of different oxidation pathways. Thus, based on  $\Delta^{17}\text{O}$  in atmospheric nitrate and sulfate, it is possible to predict oxidizing capacity (i.e. relative importance of oxidants) in the atmosphere. In this study, we present seasonal variations of  $\Delta^{17}\text{O}$  values in atmospheric nitrate and sulfate collected at at NOTO Ground-based Research Observatory (NOTOGRO) (37.5°N, 137.4°E) located at the north coast of Noto Peninsula, Japan.

The  $\Delta^{17}\text{O}$  values of nitrate showed the clear seasonal variations with summer minimum and winter maximum. This trend is resulted from the seasonal changes in the  $\text{O}_3 / \text{HO}_x$  ratios decreasing in summer by ozone destruction and HOX production (e.g. OH, HO<sub>2</sub> radicals) via UV irradiance. Although correlation between  $\Delta^{18}\text{O}$  and  $\Delta^{17}\text{O}$  values were observed throughout the year, slope between  $\Delta^{18}\text{O}$  and  $\Delta^{17}\text{O}$  values for coarse particle for winter-spring period is only different from other seasons and fine particles. Possible explanation of this different isotope pattern for winter and spring period are discussed.

For the  $\Delta^{17}\text{O}$  values of sulfate, clear seasonal variation is not observed but the  $\Delta^{17}\text{O}$  values of sulfate ranged from 0.7 to 1.9‰, being slightly higher than those observed in previous studies for Wuhan (Li et al., 2013) and haze event in Beijing (He et al., 2017), China. This difference of  $\Delta^{17}\text{O}$  values of sulfate between China and Japan may indicate that there is different thermodynamic state of aerosols (stable or metastable) and its influence to aerosol pH during long-distance transportation of  $\text{SO}_2$ .