

Characteristics of atmospheric mercury and gaseous substances observed at Mt. Fuji monitoring station during 2015 summer observation campaign

*Naoya Tsuchihashi⁴, Osamu Nagafuchi¹, Koyomi Nakazawa¹, Shungo Kato², Kuriko Yokota³, Yuki Nishida⁴, Akifumi Yoshida⁴

1.The University of Siga Prefecture, 2.Tokyo Metropolitan University, 3.Toyohashi University of Technology, 4.Graduate School of Environmental Science, University of Shiga Prefecture

It is well known that the mercury has the highly neurotoxic effect and harmful for living things, even small amount of mercury (Hg). For this reason, it is very important to understand the Hg behavior in the environment. Mt. Fuji has an elevation of 3776 meters and is a single peak mountain. Because of the high elevation, this sampling point (3766m) wasn't affected by the domestic pollution sources. Therefore, this mountain is suitable for observing long-range transport of atmospheric Hg. The purpose of this study is to clarify the dynamics of atmospheric Hg and gaseous substances synchronized with it came to Mt. Fuji monitoring site.

Mt. Fuji is the highest mountain in Japan (elevation : 3776 m). In this site, from 7 August 2015 to 23 August 2015, we continuously observed atmospheric Hg at Mt. Fuji monitoring site. Electric power was provided from a former meteorological station and a inlet tube was fixed at 1 meter distance from the building. Also, gaseous substances (SO₂ and CO) were observed at the same time. Based on the observation data, the passway of airmass was analyzed by back trajectory analysis.

The mean concentration of atmospheric Hg was 2.03 ng/m³. This mean value was higher than the background concentration level of the northern hemisphere (1.5~1.7 ng/m³). The high concentration period was observed from 11 to 12 August 2015. The peak concentration for each date were 5.59 and 6.17 ng/m³, respectively. These concentration were observed during the day time. On 11 August, the peak of SO₂ and CO concentration were also observed. On the other hand, on 12 August, the peak of CO was observed. In order to clarify the relationship between airmass route and these concentration peaks, we conducted the back trajectory analysis. Then, it is considered that volcanic gas released from Mt. Aso on 6 August may reached at Mt. Fuji monitoring site on 11 August. On the other hand, on 12 August, the air mass may came from the Asian continent to Mt. Fuji monitoring site, when high concentration peaks of atmospheric Hg and CO were observed. Result from our observation, it is considered that the atmospheric Hg and CO may came from the Asian continent to Mt. Fuji monitoring site on 12 August.

Keywords: atmospheric mercury, gaseous substance, Mt. Fuji