Geochemical characteristics of volcanic gases at Issaikyo, Azuma volcano, Japan

*Muga Yaguchi[1], Takeshi Ohba[2], Akimichi Takagi[1], Keiichi Fukui[1]

1. Meteorological Research Institute, JMA, 2. Department of Chemistry, School of Science, Tokai University

Azuma volcano is one of the active volcanoes that consist of Higashi-Azuma, Naka-Azuma and Nishi-Azuma volcanic edifices, and there is fumarolic activity at Mt. Issaikyo of the Higashi-Azuma volcano (Hasegawa et al., 2011). In this presentation, analytical results of chemical and stable isotopic (δ D and δ^{18}O) compositions of volcanic gases discharged at Issaikyo will be presented.
Gas samples were collected from fumaroles within Ooana crater (W3b, W5 and W6b in order from east to west) on the south flank of Issaikyo, and a fumarole at about 300m south of Ooana crater (W10) on July and October in 2016 by using the techniques reported by Giggenbach and Goguel (1989) and Ozawa (1968). Analyses of gas samples were conducted by mainly using the methods described by Ozawa (1968), and δ D and δ^{18}O values of the condensed water were measured by using cavity ring-down spectroscopy.
The outlet temperature of the gases at W3b, W5, W6b and W10 on October were 94.7℃, 101.8℃, 136.8℃ and 95.4℃, respectively. Relative contents of N_2, Ar, and He of gas samples were distributed in the mixing field of air, air saturated water (ASW) and andesitic gases (Fig.1). The δ D and δ^{18}O values of condensed water of gas samples were relatively high in high-temperature samples and low in low-temperature samples. W3b and W10 gases sampled on October were plotted in the low δ^{18}O side of global meteoric water line (GMWL: δ D = 8・δ^{18}O + 10; Craig, 1961) in the δ D vs. δ^{18}O diagram (Fig.2) and δ D– δ^{18}O regression slope of all the samples was about 3.6, suggesting that the volcanic gases sampled in this study are affected by mixing of groundwater and vapor-liquid separation. Several further geochemical characteristics based on the analytical result will be described in this presentation.

Keywords: Azuma volcano, volcanic gas, chemical composition, δ D・δ 18O

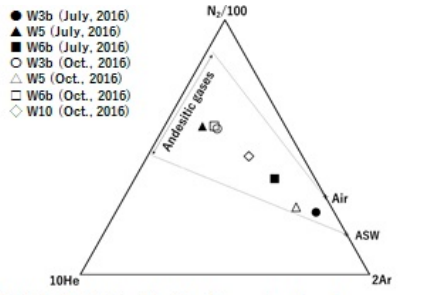

Fig. 1. Relative N_2-He-Ar contents of sampes.

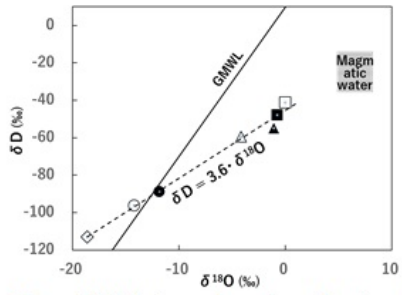

Fig. 2. δD vs. δ^{18}O diagram of condensed water of samples.

