

## Formation mechanism of the isotopic composition of the crater lake, Yudamari of Aso Volcano, Japan

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The crater lake, Yudamari formed in the Nakadake first crater of Aso volcano appears in the calm period of volcanic activity, and there is no surface runoff of the lake. Acidity of the lake is very high and the lake water contains a large amount of dissolved components such as chloride ions and magnesium ions. This kind of water quality shows that the lake is affected by volcanic gases that ejected at the bottom of the lake, including hydrogen chloride and sulfur dioxide. This crater has a steep terrain and is exposed to volcanic gases discharged from high temperature fumaroles on the crater wall. Therefore, the approach to the lake is very difficult, and the material scientific research of the Yudamari crater lake was not so advanced. However, when it was shown that it was possible to collect the lake water sample comparatively easily by a simple method using the packing rope and the acid resistance handmade water container (Ohsawa et al., 2003), the research came to be done like cutting the weir (e.g. Onda et al., 200; Miyabuchi and Terada, 2009; Ohsawa et al., 2010). In this study, in order to know the formation mechanism of isotopic composition of the crater lake water, the isotope data ( $\delta D$  and  $\delta^{18}O$ ) of the lake water sample collected by the six water sampling work performed after 2000, and we analyzed and examined the data. As a result, the isotopic composition of the lake water, based on the inflow water of precipitation origin, is determined by the addition of volcanic water vapor (volcanic gas condensate), the evaporation of the lake and the oxygen isotope exchange by water-rock interaction (rock alteration by strong acidic lake water), and the degree of contribution to them was fluctuating. In addition, the proportion of volcanic water vapor to the water of meteoric origin in the lake obtained by this study is largely inconsistent with the results led in different ways in the prior studies by Saito et al. (2008) and Terada et al. (2012).

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