

The chemical composition of thermal waters from spring and hot pool at Mt. Iwoyama of Kirishima volcano

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Mt. Iwoyama of Kirishima volcanic complex is an active volcano where fumarolic activity restarted in December 2015 at summit crater. After the restart of the fumaroles, volcanic activities at the surface, such as the expansion of fumarolic area, the appearance of thermal springs and water quality changes in springs around Mt Iwoyama have been observed. In April 2018, small phreatic eruptions occurred at the south of the summit and west flank of Mt. Iwoyama, and boiling hot pools have appeared in some of the newly created craters after the eruptions. In this study, the chemical composition of water samples collected from a natural spring site on the west flank of Mt. Iwoyama and hot pools in the newly created craters have been analyzed to obtain information for evaluation of volcanic activity at this mountain.

Between August 2016 to March 2018 (about a month before the eruption), the Cl/SO₄ of the spring water increased from 0.07 to 0.9. About a month after the eruption, the ratio increased to 1.6 as of May 2018, and remain between 1.2 and 1.6 since then to January 2019.

Cl/SO₄ molar ratio of hot water pool in one of the southern craters was 1.3 in May 2018 and 1.8-2.3 in January 2019. The ratio of hot water pool in the western crater was 1.3 in July 2018, 1.9 in October 2018 and 2.2 in January 2019. The increase of Cl/SO₄ molar ratio may be caused by several reasons, for example, the ascent of volatile-rich magma or chemical composition change of volatiles along with the progress of degassing.

Keywords: Mt. Iwoyama of Kirishimayama volcano, Thermal water, Chemical composition