Geochemical study on geothermal resources in Oku-Hida Hot Spring area, Gifu Japan

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There are many high-temperature hot springs with > 90 °C in the vicinity of Yakidake volcano across the border of Gifu and Nagano Prefectures. Koji et al. (2012) reported the chemical and isotopic (δD and $\delta^{18}O$) compositions of 30 hot spring waters and 5 river waters in this area. Most hot springs were of meteoric origin and of Na^+-Cl^-・HCO_3^- and Na^+-HCO_3^- types with low salinity (less than 30 meq/L). The estimated underground temperatures by geothermometers are 150 to 200°C at the depth of ca. 1km. The total geothermal resources in the study area are estimated to be ca. 400 MWe for producing the electricity.

Recently, geothermal well was drilled in the study area (1,200 m in depth). The Sr concentration and isotopic ratios of both hot springs and rocks are analyzed. The purpose of this study is to estimate the depth of the reservoirs which issue the hot spring waters by using Sr concentration and its isotopic composition ($^{87}Sr/^{86}Sr$) in hot spring waters and rocks obtained from a newly drilled well. In this preliminary report, the Sr concentrations of the hot spring waters collected by Koji et al (2012) were analyzed.

The results show that the hot spring waters in the southern part of the study area have slightly higher Sr concentration than those in the northern part. The Sr concentration increases with increasing of Ca concentration in the southern area, whereas those in the Northern part show an almost constant value. These results show that Sr concentration in hot spring waters reflect those of reservoir rocks.