

Geochemical characteristics of hydrothermal fluids observed along Median Tectonic Line in Mie-Prefecture, Japan.

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Island arc magmatism is considered to be triggered by the addition of fluids dehydrated from subducting slab. The relationship among volcanism, hydrothermal ore forming, and hot spring in island arc is therefore important to understand distribution of geofluid in the area. We investigated hot spring in Mie-prefecture to estimate their origin. Various types of hot spring are observed in that area, and their origin and characteristics are estimated from dissolved trace element concentrations and their isotope systematics.

We investigated the ratios of $^{11}\text{B}/^{10}\text{B}$ and $^7\text{Li}/^6\text{Li}$ of hot spring water samples as well as $^{18}\text{O}/^{16}\text{O}$ and D/H isotope ratios of water. Resultant $^{18}\text{O}/^{16}\text{O}$ -D/H ratios of water were mainly plotted along the fractionation trend of meteoric water and a mixing trend with seawater, but some samples have isotopic shifts toward heavy $^{18}\text{O}/^{16}\text{O}$ ratios, which indicate interactions with rocks under high temperature. Their $^{11}\text{B}/^{10}\text{B}$ and $^7\text{Li}/^6\text{Li}$ ratios showed very low values for some samples, which suggest that the fluids are originated from deeper part of the earth crust. In addition, a decoupling between the two isotope systems is observed.

Keywords: Groundwater, Geofluid, Median Tectonic Line, Mass spectrometry, Hot spring