

Study of sea water influence on inland-waters  
using boron isotopic compositions as geochemical tracer

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Summary

The influence of sea water on hot spring waters was investigated, as a part of geochemical study on interactions between sea water and lands using boron isotopic compositions as a tracer. Shimogamo hot springs, Izu Peninsula, was chosen for the present study. Eleven hot spring waters, two river waters and one sea water were collected and their chemical and boron isotopic compositions were measured. The findings of the study are summarized as follows.

- 1) The boron isotopic ratios of the Shimogamo hot spring waters examined ranged from 4.190 to 4.216 which corresponds to the variation in  $\delta^{11}\text{B}$  from +36.2 to +42.6 permil.
- 2) The chemical compositions of the waters suggested that hot spring waters are mixture solutions of a deep geothermal brine and a surface water, with the mixing ratios varying from hot spring water to water.
- 3) Estimated chemical composition of the brine and boron isotopic ratios of the hot spring waters strongly indicate that the brine is formed by the direct interaction of sea water and hot rocks underground and consequently Shimogamo hot spring waters are of marine origin.