Influence of volcanic activity in river floor sediment chemical composition around Hakone volcano

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Introduction: More than 100 active volcanoes are distributed in the Japanese archipelago. One of the definitions of active volcanoes is the eruption history from the past 10,000 years ago. There is no historical eruption history, and there are active volcanoes which currently have no fumarolic activity. Even in such an active volcano, there is a possibility of eruption in the future. In considering volcanic disaster prevention, it is important to predict what kind of activities the quiet active volcano will have in the future. Volcanic activity to occur in the future is highly likely to resemble the volcanic activity that occurred in the past. Even in volcanoes where fumarolic activity is not present, identifying the location of past fumarolic activity is useful for predicting future volcanic activity. River floor sediments represent the elemental concentration of the crust surface layer of the upstream area and have been used to create geochemical maps. In active volcanoes, traces of the influence of fumarolic activity that existed in the past may be left in riverbed sediments. In this study, we will take up Hakone volcano where fumarolic activity exists and investigate whether there is influence on Hayakawa mainstream and tributary flow stream sediments flowing around.
Experiment and Operation method: Samples were taken at 19 locations in the main stream and tributary of Hayakawa flowing around Hakone volcano. We gathered approximately 1 kg of river floor sediment with shovels and after having been dried, We put it out for a sieve and got an fine grain (0.30-0.85mm) and coarse grain (0.85-1.7mm). Next, using a magnet, a magnetic substance such as magnetite was removed from the sieved sample, and then ultrasonic cleaning was performed with pure water. This was pulverized in an agate mortar and dissolved using 0.15 mL of a 6 M HClO4 solution and 0.30 mL of a 25 M HF solution. This solution was further allowed to stand at 120 C. for 6 hours and at 170 C. for 6 hours, heated at 200 C. until dry up and allowed to cool. Finally, the sample was dissolved with 5.00 mL of 0.5 M HNO3 solution, and 0.5 M HNO3 solution was further added to the total volume of 25 mL to prepare a sample stock solution. This stock solution was suitably diluted and analyzed by ICP-MS (Thermo Science, iCAP Q).
Results and Discussion: For Hayakawa main stream samples, the concentrations of Sc and V are higher compared to the young crust upper chemical composition in the Japanese archipelago (Togashi et al., 2000), which was matched by the characteristics of volcanic ash excelled areas (mainly East Japan). High concentration of As was detected at the point where the river which flows through the submontane of Mount Hakone and Hayakawa river. It is reported that the As concentration is high in a hot spring that springs off at the central cone of Mount Hakone (Kanagawa Prefecture Onsen geology research center HP). The high concentration As of the river floor sediments discovered this time is thought to be the influence of the volcanic activity of Hakone volcano.
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