

Geochemical and isotopic map of Asahi River, Okayama Prefecture

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The Asahi River, one of the largest rivers in the Okayama Prefecture, has a drainage area of 1800km². Because the water from the river supports approximately 1/3 of the population of the Prefecture, understanding the origin and the circulation process of the water through construction of geochemical map is essential. We have undertaken a detailed geochemical and isotopic study of water samples collected from the Asahi River, Okayama Prefecture. A total of 77 samples were collected from the mainstream and tributary of the Asahi River from March to November 2011. All samples were filtered with 0.2 micrometer filter prior to the analyses for major dissolved constituents (F, Cl, NO₃, SO₄, Br, PO₄, Ca, Mg, Na, K), trace elements and O-H-Sr isotopes. The results obtained so far have revealed that there are systematic changes in the deuterium excess (DE), Sr isotope ratio and the concentrations of elements such as Ca, Mg, Sr and Ba from the upstream towards the downstream. Similar but less obvious changes were also observed for elements such as As, Li, Rb, Cs, Ge and Ga. These changes are interpreted to be the result of (1) difference in the air mass contributing to the meteoric water of different locations, (2) interaction with rocks with distinct geochemical characteristics, and (3) various human input. Further discussions including the seasonal changes in the geochemical characteristics of the river water will be given in the presentation.

Keywords: Geochemical map, Asahi River, Okayama Prefecture, Isotope, Trace element