Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

AHW28-P13 Room:Poster Time:April 30 18:15-19:30

Mixing of river water as deduced from major component concentration, Sr and S isotopic ratios in Tama River, Akita.

WAKASA, Sachi[1*] ; ISHIYAMA, Daizo[2] ; MATSUBAYA, Osamu[3] ; SATO, Hinako[2] ; SHIN, Kicheol[4] ; NAKANO, Takanori[4]

[1]Center for Geo-Environmental Science, Akita Unisity, [2]Faculty of International Resource Sciences, Akita University, [3]Emeritus professor, Akita University, [4]Research Institute for Humanity and Nature

The acidic high temperature hot spring discharged from the Tamagawa hot spring (Ohbuki) into the Tama River system through the Shibukuro creek is still acidic downstream. The acidity of the Ohbuki hot spring water is neutralized using limestone before it discharges into the Shibukuro creek. In this study, geochemical signatures of mixing between Tama River and its tributaries were deduced from concentration of major chemical components, Sr and S isotopic ratios. The Ohbuki hot spring water has high concentration of chloride and sulfate. The δ^{34}S of sulfate is the highest (δ^{34}S = 31.8 ‰) in the watershed. Due to the neutralization, the concentration of calcium, strontium and strontium isotopic ratio increases (^{87}Sr/^{86}Sr = 0.7068). The mixing rate of water flowing out from the neutralization facility is about 20% and 8% before and after the confluence of Shibukuro and Tama Rivers, respectively. The concentration of the major chemical components decreases gradually downstream and is almost similar to other tributaries in the Tama and Omono Rivers system. The pH of the water also decreases from 3 to neutral (about 7). The strontium isotopic ratios of 0.7040, 0.7068 and 0.7049-0.7062 for the Ohbuki, the neutralization facility and tributaries of the Tama River respectively, reflect the geology of the catchment area. A two component mixing phenomena is observed in the Tama River and its tributaries based on the major chemical components. However, the two component mixing relationship is not clearly distinct with the Sr isotope ratios. The δ^{34}S of sulfate in the Ohbuki thermal water (+31.8 ‰) and Tawa River (+6.6 – +8.8 ‰) near the confluence of the Tama and Omono Rivers supported the two component mixing relationship observed from the major chemical component. The results observed in this study are used to interpret the mixing mechanisms operating between the Tama River and its tributaries.

Keywords: Mixing of river water, Akita, Concentration of major chemical components, Strontium isotopic ratio, Sulfur isotopic ratio