

Water quality and stable isotopes of groundwater in Kyoto basin

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Kyoto is an old city in Japan with the history for more than 1000 years. Kyoto basin spreads from Kyoto to Osaka Prefecture. The area of the basin is about 18 km from north to south and about 10 km from east to west. An alluvial fan is formed in the basin by the Kamo and Katsura river. The sand and gravel are deposit thickly at the alluvial fan, and the thickness is about 100 m at the fan head and from 300 to 400 m at the fan end. There is some aquifer in the basin and a large quantity of groundwater is stored in this basin, so many people who live in the Kyoto city have been used the groundwater for long period.

There are several previous studies of the water quality and ground water flow system at the Fushimi area and Kidzu river, however the study for wide area of Kyoto basin is not exist. The objective of this study is to clarify the water quality and groundwater flow system at whole area of Kyoto basin.

From the result of investigation which carried out at July, September, November, December in 2009 and January in 2010, the following is obviously. 1) The water quality of groundwater is almost same and is not related to depth of groundwater level. 2) The water quality composition of groundwater is Ca-HCO₃ at Kibune and Arashiyama area which is north part of Kyoto basin, Na-(Cl+NO₃) at Nishijin and Fukakusa area, Ca-HCO₃ at the region around the Kamo river, (Ca+Na)-HCO₃ at the center of the basin and Na-HCO₃ at Fushimi area. These water quality are affected by the geological condition and artificial influence. 3) Thus the NO₃⁻ concentration is relatively high at deep ground water in Nishijin and Fukakusa, the artificial influence reaches the deep groundwater in this area. 4) Because the stable isotopes of oxygen and hydrogen of groundwater in Fushimi area are relatively high, it is assumed that the infiltration water from the paddy field recharges the groundwater.

In the future, we will observe the other area in Kyoto basin and estimate the recharge area of groundwater by using the water quality and stable isotopes data.

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