Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

AHW26-01 Room:203 Time:May 23 14:15-14:30

Study on the interaction of groundwater flow and denitrification process, using N isotope

Shin-ichi Onodera[1*], Mitsuyo Saito[2]

[1]Integrated Sciences, Hiroshima University, [2]Ehime University

We examined to confirm the importance and limitation of nitrogen isotopic approaches for clarifying the nitrogen cycle processes by the review works in our presentation. First of all, the nitrogen isotopic method which can detect the nitrogen cycle process in the subsurface environments has been established. The experimental report by Mariotti et al. (1981) had been listed up as the benchmark paper of Riparian zone Hydrology. In addition, the isotopic fractionation of nitrate-nitrogen and nitrate-oxigen by Bottcher et al.(1990) was also listed up as it of Isotope Hydrology. Based on these approaches, nitrogen cycle process has been confirmed.

Ishizuka and Onodera (1997) confirmed the shallow groundwater flow and denitrification process in the flow path with 100m of the distance from the upland to lowland, using nitrogen isotope. The enrichment ratio was so large even though the short distance. But because it is impossible to collect the information of the detail valuable end-members of the groundwater recharge on the every area, it is not easy to determine the denitrification amount in shallow groundwater.

Saito and Onodera (2009) indicated denitrification process with groundwater flow in a coastal agricultural mountain, using nitrogen isotope. Though the most of the tracer researches have tended to assume the groundwater flow as the simple mixing in the one box, this research considered two flow lines in an unconfined groundwater, using the oxygen isotope. Consequently, they confirmed quantitatively the mixing of two end-member component and denitrification in groundwater. In addition, the spatial distribution of them was also determined. The groundwater flow and denitrification rate is usually the different order in time scale. But we tend to discuss in similar order. We should apply to research on the transient process in groundwater flow, such as the surface water and groundwater interaction.

Keywords: groundwater flow, denitrification, nitrogen isotope