

Identification of groundwater recharges and its effect on groundwater quality in Eastern Kofu basin, using ^{18}O , D and ^{15}N

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Groundwater is being utilized drinking water over the world. However, the widespread contamination of groundwater was occurred which is one of the major problems. The objective of this study is to identify the groundwater recharges and its effect on groundwater quality in Eastern Kofu basin, using Oxygen Hydrogen and Nitrogen isotopes.

Precipitation, groundwater and river water samples were collected from the Fuefukigawa, Hikawa and Omokawa alluvial fans. The samples were analyzed for concentration of major dissolved ion using ion chromatograph (Metrohm, Compact_IC 761). The Hydrogen and Oxygen isotope values were determined using isotope mass spectrometer with water equilibration system (Sercon, Hydra20-20 and WES). Nitrate-nitrogen isotope values were determined using an elemental analyser coupled to the IRMS (Sercon, GSL and Hydra20-20) according to the method described by Silva et al.,2000.

Hydrogen and oxygen isotope values showed that precipitation and river water are the sources of groundwater recharge. The observed nitrate-nitrogen isotope values suggest that the major source of nitrate is fertilizers used in orchards. A positive correlation was observed between dissolved ions and isotope values; the concentration of dissolved ion increases with an increase in hydrogen and oxygen isotope values. Whereas; lower isotope values correspond to river water and higher isotope values correspond to precipitation. Thus, the result suggests that precipitation acts as a carrier and river water acts as a diluent for the dissolved ions concentration in groundwater of the study area.

Reference:

Silva S. R., et al. (2000) A new method for collection of nitrate form fresh water and the analysis of nitrogen and oxygen isotope ratios, Journal of Hydrology, 228,22-36.