



Geochemical tracers for the groundwater and streams in central mountainous regions of Taiwan

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Noble gases have been considered as sensitive tracers for groundwater due to their unique geochemical characteristics. In this study, groundwater of the monitoring wells and river water were collected for geochemical analysis, including Radon concentration and Helium isotopes, from central mountainous regions of Taiwan to discuss their fluid sources. The results of hydrogen and oxygen isotopic values are $-77.8\text{--}36.5\text{\textperthousand}$ and $-10.7\text{--}6.3\text{\textperthousand}$ respectively, falling on the local meteoric water line of Taiwan. It revealed that groundwater source in studied area is mainly from the precipitation. The helium isotopic ratios of the samples range from 0.78 to 1.13 Ra. It implies that, in addition to the air-saturated water, there are additional sources for the groundwater in central mountainous regions of Taiwan. Interestingly the water sample from Liwu River was detected high ^{222}Rn concentration, 7.66 kBq/m³, which is much higher than background values in normal river water. It suggests that local groundwater with high ^{222}Rn concentration of $1.38\text{--}75.4$ kBq/m³ may play important role for the Liwu River. Combined with other geochemical tracers, like $^{87}\text{Sr}/^{86}\text{Sr}$ and carbon isotopes of DIC, we will further discuss possible interaction between the groundwater and surface water with bed rocks.