

Isotopic study of stream water from the Shimanto River, Kochi and Ehime Prefectures, southwestern Japan

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Analysis of isotopic compositions were carried out for 70 stream water samples taken from in and around the Shimanto River area, Kochi and Ehime Prefectures, southwestern Japan, in December 14-18th, 2007 and October 22-24th, 2008.

Hydrogen isotopic compositions of them were from -35 to -55 permil, and oxygen isotopic compositions from -6 to -9 permil. The relation between hydrogen and oxygen isotopic compositions was $dD=7.0 \times d^{18}O+7.3$ ($R^2=0.95$), which is so similar to those of rainfalls obtained in Tokyo area, $dD=6.87d^{18}O+4.70$. D-excess ($dD-8 \times d^{18}O$) were from 12 to 17.

The relations between average heights of sampled stream and hydrogen/oxygen isotopic compositions were $dD=-0.0174H-31.3$ ($R^2=0.94$) and $d^{18}O=-0.0024H-5.53$ ($R^2=0.96$), those are reduced from samples obtained from eastern part of the Shimanto River area, whereas $dD=-0.0164H-37.9$ ($R^2=0.72$) and $d^{18}O=-0.0026H-6.24$ ($R^2=0.86$) from western part. The values of altitude effect (-0.016 to -0.017 permil/100m for dD and -0.0024 to -0.0026 permil/100m for $d^{18}O$) are similar to those reported in Japan. It is deduced that the difference of the values of altitude effect between eastern and western parts of the Shimanto River area originates from the rainshadow effect.