

Characteristics of stable isotopes in river water, groundwater and spring water in Japan

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The deuterium excess (d-excess) values of precipitation in Japan are low in warm periods and high in cool periods. Because groundwater, spring water and river water are recharged by the precipitation mostly in Japan, the d-excess values are useful to estimate the recharge area and recharge time (season) of the groundwater and spring water, etc. In this study, groundwater, spring water and river water were sampled in various places in Japan to grasp the characteristics of d-excess distribution. Water quality and stable isotopes of oxygen and hydrogen were determined for all samples. The stable isotopes of oxygen and hydrogen are relatively low in northeast and relatively high in southwest. The d-excess values are relatively high on the side of the Sea of Japan and relatively low on the side of the Pacific Ocean. The isolines of d-excess (d=15 and d=20) are located at the Ou Mountains, Echigo Mountains, Tanba Highland and Chugoku Mountains. It is estimated that the air mass which is main source of groundwater, spring water and river water is varied with these mountains.