

Estimation of groundwater retention time in deep underground

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Isotopic studies (^3H , D/H , $^{18}\text{O}/^{16}\text{O}$, $^{13}\text{C}/^{12}\text{C}$, $^{14}\text{C}/^{12}\text{C}$) of groundwater have been conducted at the Tono research site in central Japan. The D/H and $^{18}\text{O}/^{16}\text{O}$ ratios of the groundwater indicate its meteoric origin. In order to estimate the ^{14}C ages of groundwater, it is necessary to correct the contamination of non-active carbon in relation to the evolution of DIC. The DIC evolution during the infiltration of groundwater in the granite is possibly due to dissolution of soil CO_2 in the surface and dissolution of dead carbon carbonates minerals such as calcite in the granite. The ^{14}C activities were corrected based on mass balance using $^{13}\text{C}/^{12}\text{C}$ ratio of soil CO_2 and carbonates minerals. The corrected ^{14}C age range from several thousands to ten and several thousands years.