

Groundwater age determination by using ^{85}Kr in groundwater at the Kakitagawa spring water in Mt. Fuji spring discharge area

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Groundwater age dating study around Mt. Fuji area have been conducted by several researches (Ochiai, 1970; Yoshioka et al., 1993; Mahara et al., 1993; Asai and Tsujimura, 2010; Tosaki et al., 2011; Ohta et al., 2012). Various methods were adopted in Mt. Fuji spring discharge area such as ^3H , noble gases, CFCs, $^{36}\text{Cl}/\text{Cl}$ and $^{228}\text{Ra}/^{226}\text{Ra}$ activity. All results show relatively young age (0 to several decades) in the Mt. Fuji groundwater, except for CFCs method which affected local anthropogenic source (Asai and Tsujimura, 2010). However, the result in each method contains the "uncertainty" of its age. Unlike these methods, Krypton 85 (^{85}Kr) has high resolution for the age estimation, hence we conducted age determination at the Kakitagawa spring water located in the southeastern part of Mt. Fuji. Krypton 85 (^{85}Kr) is a man-made trace gas from reprocessing plant origin whose atmospheric concentrations have been increasing over the past few decades. As it is soluble in water, it can be used as groundwater age indicators over timescales ranging from a few years to a few decades. ^{85}Kr specific activities in groundwater was $1.022 \pm 0.028 \text{ Bq/m}^3$, and the estimated age were 5.2 ± 0.4 years. This young age is corresponding to the previous studies, additionally the range of the estimated age by ^{85}Kr was much smaller compare to other methods. Furthermore, ^{85}Kr method shows the strong advantage against the anthropogenic contamination.

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