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Tritium content distribution in Jeju island groundwater using Ni-Ni electrolytic enrichment method

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Jeju is a volcanic island located about 90 km south of the Korean peninsula. This area is covered with highly permeable basaltic rocks from the Pliocene through the Quaternary. These rocks are highly permeable and forming the principal aquifers. Therefore, ground water is the sole fresh water resource and provides almost all of the water demand because of the low content of the surface water.
In this work, tritium levels in Jeju island groundwater were studied with a liquid scintillation counter(LSC) and electrolytic enrichment method using Ni-Ni electrodes. Tritium enrichment parameters are estimated with different current and total current charge variation. From the established optimum tritium enrichment condition, we analyzed fifty eight mountainous area groundwater samples of Jeju island.
The tritium separation factor was from 8 to 36 with a current density variation. The detection limit of tritium measurement is about 0.06 Bq/L using 1000 mL sample and 600 min counting time. The tritium concentrations in fifty eight groundwater in Jeju island were ranged <0.06 TU-0.46 Bq/L and averaged value was 0.25 Bq/L.

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