

Tritium Distribution in Groundwater at Keum River Basin

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Tritium is a natural radioactive nuclide and a pure beta emitter ($E_{\max} = 18.6$ keV) with the half-life of 12.43 years. It is produced by cosmic-ray bombardment of nitrogen and deuterium in the upper atmosphere. It is incorporated in the meteoric water molecules by oxidation, precipitates as a HTO in the rain, and moves within various compartments of the hydrologic cycle. As a component of the water molecule, it is the most conservative tracer for groundwater. When water infiltrates groundwater, it becomes isolated from the atmospheric tritium source, and its tritium concentration decreases over time due to radioactive decay. Therefore, tritium is used for dating tool for groundwater in the age range recent to 100 years after the groundwater dating study. Keum river is a major river in Korea and it supply water source around agriculture field. And also groundwaters around Keum river basin were major water supply near agriculture at dry season. We sampled 128 groundwater around Keum river basin and major ion and H-3 were analyzed and their distribution was studied. Among the sample we selected 4 region for most suitable water supply place and H-3 distribution was analyzed. Average H-3 concentration of each region was 2.19 ± 0.59 TU at KS region, 2.15 ± 0.55 TU at KJ region, 2.38 ± 1.08 TU at NS region and 2.88 ± 0.43 TU at BO region.

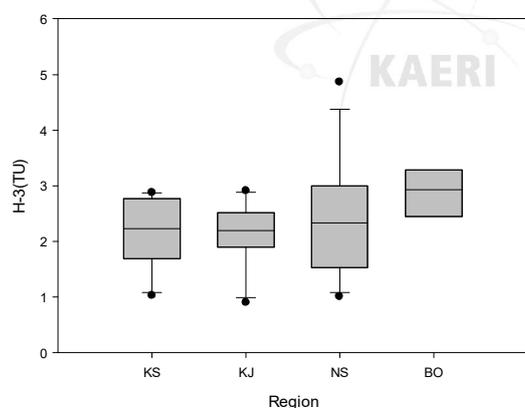


Fig. 1. Tritium distribution at Keum river basin.

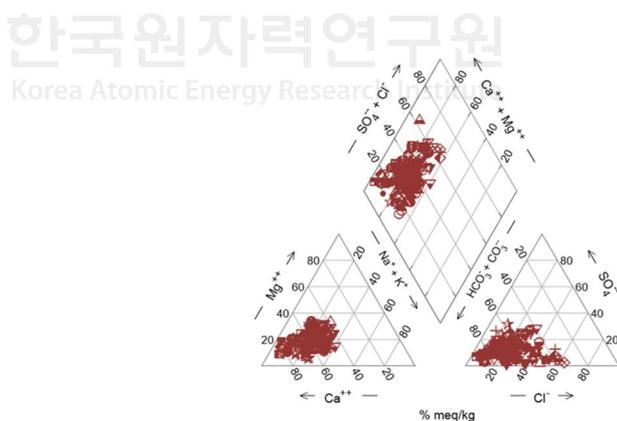


Fig. 2. Piper diagram of Keum river basin groundwater

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