

## Deep groundwater mobility at costal area estimated by groundwater dating

\*Takuma HASEGAWA<sup>1</sup>, Kotaro NAKATA<sup>1</sup>, Yuichi Tomioka<sup>1</sup>, Tomoko Ota<sup>1</sup>, Atsunao Marui<sup>2</sup>, Isao Machida<sup>2</sup>, Reo Ikawa<sup>2</sup>, Masahiko Ono<sup>2</sup>, Shinji Matsumoto<sup>2</sup>

1. Central Research Institute of Electric Power Industry, 2. The National Institute of Advanced Industrial Science and Technology

On high-level radioactive waste disposal, “Nationwide map of Scientific Features for Geological Disposal” was published and costal area is the favorable from transportation point of view. To evaluate deep groundwater mobility at coastal area, groundwater was sampled from deep borehole at the order of 1000 m in depth. Major ions, tritium, carbon-14, chlorine-36 were measured. Based on these results, the groundwaters were categorized into four groups, which are modern meteoric water, modern seawater, glacial meteoric water, fossil sea water. Meteoric water and seawater was divided by 1900 mg/l of Cl concentration. Modern and old groundwater was divided by 10 pMC of <sup>14</sup>C concentration. The type of seawaters was well categorized into modern seawater and fossil seawater by <sup>14</sup>C concentration because residence times of modern seawater and fossil seawater are quite different. <sup>36</sup>Cl/Cl of Modern sea water is equivalent to that of present seawater ( $\approx 0.7 \times 10^{-15}$ ), and that of fossil sea water is higher than that of present seawater. It indicates that <sup>36</sup>Cl/Cl of fossil seawater influenced by in-situ production, which takes at least a few ten thousand years. Thus, the category of modern seawater and fossil seawater was validated by not only <sup>14</sup>C but also <sup>36</sup>Cl. Due to the lack of information, which are shallow groundwater and surface investigation, it could not be confirmed that modern meteoric water and glacial meteoric water was categorized by water isotopes and noble gas temperature. However, it is deduced the origin of Cl of meteoric water is from modern seawater and that of glacial meteoric water is from fossil sea water. It is thought that the age of mixing water reflects the groundwater age.

As a result, the deep groundwaters at costal area were categorized into modern meteoric water and modern seawater about 40%, glacial and fossil seawater about 60%.

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