Study on the Groundwater Evolution by Applying the Statistical Multivariable Analysis, An Example on Horonobe Area, Hokkaido.

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In the Horonobe Underground Research Laboratory Program, which the Japan Nuclear Cycle Development Institute is carrying out in northern Hokkaido, a total of eight boreholes, HDB-No.1 to No.8 holes, were drilled from 2001 to 2003. We discussed the groundwater geochemistry on the data acquired from from the groundwater samples of the boreholes, and pore water samples squeezed from rock cores; and classified them into two main end-members based on the qualitative grouping method and the statistic multi-variable analysis.

Our study showed that there is no significant difference between groundwater samples and pore water samples. The two main end-members of the groundwater chemistry were classified as a freshwater system which has a low D/H isotopic ratio, and an old seawater system which has a high D/H isotopic ratio.

For the purpose to estimate the chemical interaction between groundwater and rock, the geochemical calculation method was applied using data of mineral composition of cores and data of groundwater chemistry. We confirm that calculated value and acquired value of REDOX situation were getting close each other in some calculation cases.