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## Comparison of pore water chemistry after extraction from sedimentary rock by different methods

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It is difficult to obtain physical data in sedimentary rock with low permeability, because the groundwater velocity reduces as the depth increases. In regions with this type of rock, geochemical data is very important to understand the groundwater flow conditions. However, in situ groundwater sampling is very difficult because of the sampling schedule, cost, and technical requirements. Many previous studies have suggested that geochemical data from pore water could be used in these cases. Squeezing, centrifugation, leaching, and direct equilibration have been proposed as major extraction methods for pore water. Among these methods, squeezing has been used in the widest range of studies. However, water sampling by squeezing needs to be conducted under appropriate pressure conditions, because rock failure from excessive pressure can influence the chemical and isotopic composition of the pore water. In this regard, centrifugal extraction is advantageous, because it is not influenced by rock failure. However, the application range of this method to rock samples is small, and isotopic fluctuation can occur because of the long exposure time of the sample to the air. To date, the pore water chemistry after centrifugal and squeezing extraction has not been compared in detail for Japanese soft sedimentary rock.

The purpose of this study was to clarify the advantages and disadvantages of both extraction methods based on chemical analysis of the pore water. Both methods altered the isotopic composition of the pore water rather than its chemical composition. For water samples extracted by the same method, extraction conditions such as pressure and rotational speed also influenced what specific ions were present in pore water. The latest results from this study will be reported.

Keywords: pore water, squeezing, centrifugation, water chemistry, stable isotopic ratio