

# 238U-234U-230Th radioactivity disequilibrium analyses of calcite vein in drill core penetrating the Nojima fault, Japan

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## [Introduction]

The fluids in the seismic fault zone have substantial influences on the activities of the fault. Therefore, it is important to decipher the origin and migration mechanism of the fluids related to faults. In this presentation, we report U-Th radioactivity disequilibrium analyses of calcite vein in DPRI drill core penetrating the Nojima fault, Japan. Our aim of this study is to elucidate the source of the fluid and the timing of infiltration, and its migration mechanism in the Nojima fault.

## [Experiments]

Using the Nojima DPRI 1,800 m core, we analyzed U-Th radioactivity disequilibrium of carbonate minerals.

The carbonate samples were dissolved using acid completely. Next, a spike was added to a part of the sample. The most part of the samples was used for isotope measurement. Then, U and Th were separated from Ca by Fe-coprecipitation. Dowex anion-exchange resin (AG1-X8, BioRad) was used for Th purification, and UTEVA resin (Eichrom) for U. Isotopic compositions of purified spiked and unspiked U and Th were measured by a multi-collector ICP mass spectrometer (IsoProbe, Micromass). The U and Th blank through the chemical treatments were 20pg for U and 2pg for Th, respectively.

## [Results & Discussions]

We measured U-Th radioactivity disequilibrium of carbonate minerals from the Nojima fault. The age of calcite was not determined because of its high Th content. However, it is likely that calcite precipitated before 50 ka, because the isotopic data are distributed close to the equiline in the isochron diagram.

Furthermore, the samples have various compositions even in the same depth. This indicates that the samples formed by different process such as the difference of fluids, different age for precipitation, and/or the degree of open system.

We are analyzing U-Th radioactivity disequilibrium using the Nojima core drilled by NIED.