

## Development of $^{230}\text{Th}$ - $^{234}\text{U}$ dating of carbonate minerals by MC-ICPMS

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Carbonate minerals are often found in a fracture zone of an active fault. The minerals are precipitated from ground water and their crystallization ages may record the period when a fault was active. We attempted to investigate the relation between the crystallization age determined by U/Th radioactivity disequilibrium dating of a carbonate mineral and active period of a fault.

In this presentation, we report analytical aspects of the study. The precision of U/Th isotope dilution analysis and the isotope ratio analysis were evaluated by a JLs-1 (GSJ) limestone standard rock. A 250mg of JLs-1 was dissolved and divided into five fractions. The solutions were analyzed for abundance and isotopic measurements with a method described later. Furthermore, a coral sample (120,000 years from the Caribbean Sea) was used to check the accuracy of our analytical schemes.

First, 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.

The reproducibilities of  $^{234}\text{U}/^{238}\text{U}$  and  $^{235}\text{U}/^{238}\text{U}$  for quintuple measurements of JLs-1 were 0.1% and 0.08% (2SD), respectively. The reproducibility of U abundance measurements was 0.1%. On the other hand, reproducibility of  $^{230}\text{Th}/^{232}\text{Th}$  measurements and Th abundance measurements were 4% and 8% (2SD), respectively. The imprecise results of Th were caused by a memory effect of a Th standard reagent used for mass discrimination correction and gain calibration between a Daly multi-collector and a Faraday cup. With replacing the Th standard to a natural U solution, we improved precision of Th analyses.

The result of dating of the coral sample was  $139 \pm 22$  (2SD) ka, and agrees well with 120ka reported by J.B.Paces et al. (personal communication).