Ages of underthrust barite crystals of the Nankai Accretionary Prism (IODP Exp 370 Site C0023)

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１．Purpose of research

Fluid migration in subduction zones is envisaged to be triggered by seismic events or vice versa and involves sudden changes in the formation pressure. Thus fluid migration likely contributes to the geological evolution of subduction zones and also has individual effects at the small scale. Our project aims to identify the age and origin of the hot fluid that flowed in the Nankai Accretionary Prism, which formed barite mineralization and was discovered in Expedition 370 of the International Ocean Discovery Program.

２．Summary of works at KCC and at OUS over the past year

We used Kochi Core Center's (KCC) gamma-ray detector to measure the amount of radiogenic U, Th, K, Ra isotopes in the barite and sediment samples from IODP Expedition 370. Measurement results are used for calculating the 226Ra-210Pb ages and electron spin resonance (ESR) ages of the barite, the work of which was done at Okayama University of Science (OUS). Those ages represent the timing of fluid flow in the Nankai Accretionary Prism. The ^{226}Ra contents also give hints to the bedrock geochemistry of the fluid reservoir.

３．Research progress

Measurement is on-going. Due to the small sample sizes of some samples, measurement time could be long and we are grateful for KCC's accommodation.

４．Current finding

The ^{226}Ra-^{210}Pb ages obtained from barite minerals suggest that the hot fluid flowing in the Nankai Accretionary Prism is a young event (Holocene). Ages of the barite is much younger than the hosting sediment (Mid- to Late-Miocene). Such young fluid events may be related to modern seismic events of the region. Based on the data measured at KCC, we are carrying out calculations of the ESR ages to obtain ages of the older phases of the samples.