

Estimation of the sea floor events by radiocarbon dating of total organic carbon contained in marine sediment

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Depositional age of hemipelagic mud is generally determined by radiocarbon dating of planktonic foraminifera ($^{14}\text{C}_{\text{foram}}$). In the areas with low production of planktonic foraminiferal fossils like in the forearc basins along the Nankai Trough, radiocarbon age of total organic carbon (TOC) contained in marine sediments is also available. In the Nankai Trough, the production of planktonic foraminiferal fossils is small because many clastic wastes from the land flow into the sea through Kumano river. However, TOC age generally shows older than planktonic foraminifera age because TOC includes materials of various origins from the land and the ocean. Especially, remobilized event deposits by submarine landsliding or slumping include old TOC buried in deeper sequences. Therefore, we will be able to identify event deposits from continuous TOC age measurements.

Omura et al. (2016, Geol. Soc. Japan Abstract) measured radiocarbon dating of TOC ($^{14}\text{C}_{\text{TOC}}$) ages of a short core (60 cm) obtained off Kumano, succeeded in discriminating flood sediments, seismo-turbidites and hemipelagic mud originated from the Kumano river. Therefore, we would like to verify that continuous measurement of $^{14}\text{C}_{\text{TOC}}$ can be applied to older sequences. Also, our research aims to establish an estimation method of depositional event (e.g. earthquake or flood) to clarify the exact age of the event which have not known so far.

We measured the $^{14}\text{C}_{\text{TOC}}$ contained in hemipelagic and turbidite layers by using Accelerator Mass Spectrometry (AMS) to investigate the depositional age of event deposits such as turbidites which can be detected by X-ray CT scanner. The results show age reversals in the turbidite layers suggesting sediment reworking and contamination of old organic carbon although age reversals were also observed in a few sequences where turbidites cannot be recognized. Thus, continuous measuring of $^{14}\text{C}_{\text{TOC}}$ ages of marine sediment might detect the turbidites which could not be observed in X-ray CT images. We will also present discrepancy between $^{14}\text{C}_{\text{TOC}}$ and $^{14}\text{C}_{\text{foram}}$ ages corresponding to sediment source-to-sink.

Keywords: hemipelagic mud, radiocarbon dating, total organic carbon , event layer