

Shinsuke Kawagucci's account of his time at WHOI

I visited Woods Hole Oceanographic Institution (WHOI) from 07/10/2010 to 22/11/2010, supported by an IR postdoctoral fellowship program for international collaborative research. The visit was very successful and my special thanks goes to the host scientist Dr Jeff Seewald and his colleague Sean Sylva for their great help and kindness. They supported me not only to carry out experiment smoothly but also to live in the US for the first time.

An experiment to investigate fluid-sediment interaction under hydrothermal condition (pressure, temperature, and natural water-sediment ratio) was carried out to determine (refine) the typical thermogenic characteristics to the methane and the relative molecules (H₂, CO₂, and hydrocarbons). The origin of abundant methane in the sediment-associated hydrothermal fluid has long been debated but not much is known. While geochemical diagnosis was often used for investigating the origin, typical geochemical signature of the thermogenic products associated with hydrothermal activities remains unidentified. The experiment had been expected to fill in this critical data gap in our knowledge on generation of sedimentary methane and other reducing gases. Once the thermogenic signature is better constrained, these chemical characteristics can be used to better model the proportions of mixed biogenic/thermogenic gases in the venting fluids at sediment-associated fields. For this purpose, seafloor sediment taken from the JADE hydrothermal site, Okinawa Trough, was used as a starting material and was put into a flexible-cell hydrothermal apparatus in WHOI that was well established for fluid-solids reaction experiments. Stepwise heating and temporal samplings were continued for six weeks during my seven weeks stay. The chemical composition of sampled fluid was analyzed by ion chromatography and gas chromatography, while some aliquots of the samples were preserved for future analyses on stable carbon and hydrogen isotope ratios of hydrocarbons. All the operations on the experiment were first done by Jeff/Sean and then on my own. The experiment went well without a major problem and an excellent, publishable dataset was obtained. Later on, a seminar to introduce my research to the people related to InterRidge and/or hydrothermal activity was organized. A forty-minutes talk in English was indeed very hard for me, also as a non-native English speaker; however I believe that everyone could understand me and became interested in my research. After the seminar, I had a chance to discuss with Dr Chris German about the future collaborative cruises between JAMSTEC and WHOI.

During my visit, I lived in one of the WHOI guest houses. It was very comfortable and I had two roommates: Longtao Sun from the South China Sea Institute of Oceanography who is to collaborate with Dr Jian Lin, and Mark Van Middlesworth, an WHOI Engineer Assistant II in the Deep Submergence Lab from the Applied Ocean Physics and Engineering department. They were both nice to me. I could also enjoy being in the WHOI soccer-football team and loved playing football on lunch breaks. I hope that this program continues to provide opportunities for many students/postdocs from around the world. Finally, I would like to thank everyone who keeps the fellowship program running for their great efforts and warm support.