

Vertical profiles of pore fluids chemistry beneath the active hydrothermal area at Iheya Knoll in the Okinawa Trough

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Several piston core samples were obtained from the active seafloor hydrothermal field of Iheya North knoll, Mid-Okinawa Trough, using the NSS (Navigated Sampling System). They were the first NSS samples recovered from an active hydrothermal field. Those coring were aimed at a dense Vestimentiferane tube-worm site, a giant-clam *Calyptogena* site, and a bubble emission site with pinpoint using the NSS monitor system and also a non-animal and non-shimmering site as control. As a result, core samples ranging 1 to 3 meters in length were recovered from those sites, and the cores were mainly composed with clayey sediment and massive and fragmentary pumice. Pore water samples were squeezed from the clayey sediment and massive pumice layer, and some of them emitted strong smell of hydrogen sulfide.

Unique vertical chemical profiles have been obtained from the tube-worm and clam areas. Although those hydrothermal-endemic animals are depend on hydrogen sulfide and/or methane as a their energy source for chemosynthesis, those areas were rich in hydrogen sulfide. The concentration of hydrogen sulfide and alkalinity tended to increase with depth from seafloor, while that of sulfate were decreasing. It suggests that hydrogen sulfide is provided by in situ bacterial sulfate reduction. The bacterial sulfate reduction may be fueled by methane as an electron donor. On the other hand, the concentrations of major cations and chlorine in the pore water at the areas were increasing with depth, and the minimum concentrations of them were significant lower than those in seawater. It suggests that the upper parts of the cores are mixed with fresh water, however, the origin of fresh water is under consideration.