

## Gas characteristics in shallow sediment cores retrieved at the gas seep area of offshore Sakhalin, the Sea of Okhotsk

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In 2009, we investigated a new area of offshore Sakhalin Island, the Sea of Okhotsk, to estimate gas hydrate accumulation field. In the north area of Lavrentyev Fault, more than ten gas seep sites were discovered since 1990s and hydrate-bearing sediments were recovered by using a gravity corer. These sites often accompany with gas plumes from the sea floor and gas hydrates exist in a shallow sediment layer. Sakhalin Slope Gas Hydrate (SSGH) project was started in 2007 and we first retrieved sediment cores from the southern area of Lavrentyev Fault during the SSGH09 cruise on July-August 2009.

Unfortunately, we could not get hydrate-bearing cores from the new field, but the following gas data provides some information. We obtained the samples of dissolved gas in pore water on board, and after coming back to the laboratory we measured molecular and stable isotope compositions of them. Empirical classification of the methane stable isotopes ( $\delta^{13}\text{C}$  and  $\delta\text{D}$ ) according to Whiticar et al. (1986) and Schoell (1988) indicated their microbial origin via carbonate reduction. Profiles of methane concentration in the pore water increased exponentially with depth, and their gap appeared about 2m depth from the sea bottom suggested shallow SMI (sulfate-methane interface).

We also retrieved a hydrate-bearing core from the Lavrentyev Fault area, named "Dungeon". Though gas hydrate at Dungeon was first discovered in 2005, precise information about the crystal has been unknown. Molecular and stable isotope compositions of hydrate-bound gas were almost the same as those of other seep sites offshore Sakhalin Island. Raman spectroscopic analysis showed that the hydration number was 6.12.

In this presentation we discuss about the depth profiles of molecular and stable isotope compositions of dissolved gas in pore water obtained from both SSGH and CHAOS (hydroCarbon Hydrate Accumulations in the Okhotsk Sea, 2003-2006) projects.

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