

Marine surveys for gas-hydrate off Abashiri, the Sea of Okhotsk

YAMASHITA, Satoshi^{1*}, MATSUMOTO, Ryo², MINAMI, Hirotsugu¹, HACHIKUBO, Akihiro¹, HIROMATSU, Mineo², TOMARU, Hitoshi², OKUDA, Yoshihisa³, Hitoshi Shoji¹, TAKAHASHI, Nobuo¹

¹Kitami Institute of Technology, ²Earth and Planetary Sci., Univ. of Tokyo, ³AIST

When the resources project of gas-hydrate was stood in Japan at 1995, clear BSR has been also confirmed in the seismic data of the Kitami-Yamato Bank off Abashiri, the Sea of Okhotsk, and the possibility of existence of gas-hydrate has been pointed out (Sato et al, 1996; Sakai, 1996). Moreover, obvious BSR has been also confirmed in the seismic data (SBP and SCS) collected during GH01 cruise that carried out off Abashiri, the Sea of Okhotsk in 2001 conducted by Geological Survey of Japan, AIST (Noda et al, 2009). However, the sufficient survey is not carried out after GH01 cruise, and the actual condition is not clear.

Therefore, the cooperated survey for the gas-hydrate was performed with Kitami Institute of Technology which has the survey experience regarding the gas-hydrate in offshore Sakhalin Island, the Sea of Okhotsk and Univ. of Tokyo team which has that in the eastern margin of the Japan Sea. This survey is a pilot study to start the substantial survey after next year and the main purposes are below.

1) To retrieve the sea-bottom sediment of the length of 50 or more cm at least from the top of the gas chimney structure where decided from the SBP record published in the Web of AIST.

2) To check the presence of the trace of methane spring and/or gas-hydrate from the sediment properties.

3) To decide the SMI depth from the composition of pore water, and to evaluate the strength of methane flux.

4) To clarify the temperature profile of sea water, and to evaluate the stability of shallow gas-hydrate.

5) To clarify the composition and origin of dissolved gas in the pore water.

The surveys were carried out for three days in September, 2011, with the Abashiri Submarine Canyon area (water depth is about 900 m) that is in offshore about 30 km in the northeast from Abashiri. Used R/V is Taiki-maru (19 ton). To retrieve the sea-bottom sediment, a gravity core sampler (length is about 2 m) was used, and maximum retrieved core length was 1 m. To measure the strength of sediments immediately after recovery, the cone penetration test was performed on board. For sediment, pore water and gas analyses, subsampling was conducted for the cut core. The measurement of water temperature from the sea-surface to sea-bottom and the water sampling at regular interval were also conducted.

It was not possible to retrieve the gas-hydrate in this survey. On the other hand, it was confirmed that the methane is dissolving with high concentration in the pore water of sea-bottom sediments. The concentration was similar to that of the core sample retrieved from offshore Sakhalin Island, the Sea of Okhotsk, where the gas-hydrate was retrieved. Thus, it was suggested that there is the possibility of existence of gas-hydrate even from the temperature/pressure condition on the survey sea area.

Keywords: gas hydrate, marine survey, Sea of Okhotsk, sea-bottom sediment, pore water, dissolved gas