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サハリン沖LV47およびLV50海底表層ガスハイドレート含有コア間隙水の同位体分析
Isotopic analyses of pore waters of LV47 and LV50 gas hydrate-bearing sediment cores from offshore Sakhalin Island

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From July to August of 2009 and June of 2010, field operations of SSGH-09 (Sakhalin Slope Gas Hydrate Project, 2009) and SSGH-10 projects were conducted as the 47th and 50th cruises of R/V Akademic M.A. Lavrentyev.

Gas hydrate-bearing and -free sediment cores were retrieved using steel gravity- and hydro- corers. The sediment pore water was obtained onboard by using a squeezer designed and constructed at KIT (Kitami Institute of Technology, Japan). The stable isotopic compositions (delta 18O and delta D) of these water samples, ionic compositions in sediment pore water, gas hydrate water (dissociated gas hydrate water) and seawater samples and water content distribution in the sediment cores and lithologies of the cores were compared to figure out the geochemical characteristics of the cores.

The depths of SMI (sulfate-methane interface) are 0.4-0.8 mbsf for the gas hydrate-bearing LV47-24HC, LV50-29HC, LV50-31HC and LV50-33HC cores and 0.5-4.0 mbsf for the other gas hydrate-free (by visual observation) cores.

The relationship between the delta 18O and delta D values of the pore water of the gas hydrate-bearing LV50-29HC core, the gas hydrate water from the LV50-29HC core and seawater from the corer of the LV50-29HC was investigated and a linear relation among them was found. These results suggest that the source of the water is the same and that it might be the pore water primarily originated from seawater.

Some sediment cores have shown traces of gas hydrate formation or dissociation, i.e., changes in concentrations of dissolved ions and/or in stable isotopic compositions of hydrogen and oxygen. The further investigations/discussions will be presented.

キーワード: メタンハイドレート, 間隙水, ハイドレート水, 安定同位体
Keywords: methane hydrate, pore water, hydrate water, stable isotope ratio