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Geochemical study of LV47 sediment cores and pore water retrieved at northeastern continental slope off Sakhalin Island

Hirotsugu Minami[1], Akihiro Hachikubo[1*], Satoshi Yamashita[1], Hirotoshi Sakagami[1], Hitoshi Shoji[1], Young K. Jin[2], Anatoly Obzhirov[3]

[1]Kiatami Institute of Technology, [2]Korea Polar Research Institute, KORDI, [3]V.I. Il'ichev POI FEB, RAS, Russia

Geochemical study of pore water and sediment samples was conducted to find out geochemical differences among gas seepage structures offshore northeastern Sakhalin Island based on the analyses of LV47 gas hydrate-bearing and -free sediment cores retrieved at gas seepage structures and a reference core retrieved outside seepage structures. The ionic compositions (chloride-, sulfate- and hydrogen carbonate ions, and sodium, potassium, calcium, magnesium) in the sediment pore water and seawater samples, stable isotopic compositions (oxygen and hydrogen) of water samples, water-content in the cores and lithologies are compared to find out the geochemical differences among the cores. One of the cores, LV47-24HC contained lens layered and lamellar gas hydrates at sub-bottom depth of 0.9-1.2 m below sea floor. The depth of sulfate methane interface, carbonate distribution, enrichment of pore water in conservative constituents and the presence of water with anomalous isotopic composition provide suggestive evidence for increasing input of free gas and/or gas-saturated water with different ionic- and isotopic-compositions from those of seawater.

Keywords: methane hydrate, sediment core, pore water, chemical analyses, ions, stable isotopic ratios