

## Chemical analysis of LV59 sediment pore waters retrieved off Sakhalin Island, Russia

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The Sakhalin Slope Gas Hydrate Project (SSGH) is an international collaborative effort by scientists from Japan, Korea, and Russia to investigate natural gas hydrates (GHs) that have accumulated on the continental slope off Sakhalin Island, Okhotsk Sea. In 2012, the field operation of the SSGH-12 project was conducted as the LV59 cruise of the R/V Akademik M.A. Lavrentyev. GH-bearing and -free sediment cores were retrieved using steel hydro- and gravity corers.

The pore water was sampled on board using squeezers designed and constructed at the Kitami Institute of Technology (KIT). A 10-cm depth interval of the sediment core was drawn into the squeezer, and pore water was then directly collected into a polyethylene syringe connected to the discharge tube of the squeezer. The other end of the syringe was connected to a membrane filter cartridge containing a 0.2-um filter. Seawater samples were obtained from the top of the corer. All water sample was filtrated through a 0.2-um filter and then taken into a polypropylene bottle.

The concentrations of anions in the pore waters were measured at KIT. Sulfate concentrations decreased linearly with depth to the sulfate methane interface (SMI). The linearity of these profiles suggested that sulfate depletion is largely driven by an upward flux of methane, rather than by the flux of organic matter from above, and the anaerobic oxidation of methane (AOM) at the SMI. The linear sulfate profiles are formed in a steady state based on sulfate and methane co-consumption at the SMI and the balance of sulfate and methane fluxes. The SMI of the GH-bearing LV59-27HC core was 0.5 m below the seafloor (m bsf). Since the depth of the SMI depends on the intensity of the upward methane flux, we can conclude that intensive methane flux was observed at the GH-bearing core.

Keywords: gas hydrate, pore water, chemical analysis, Sakhalin Island, Russia