

Methane hydrate dissociation experiments in submarine sediments from the Okhotsk Sea

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Submarine gas hydrate investigations were conducted in the Sea of Okhotsk by the international project, CHAOS (a joint effort among Japan, Russia, Germany, Belgium and Korea) in 2003. Hydrate bearing sediment cores were successfully recovered from CHAOS(C site) and KITAMI(K site) gas seeping structures offshore Sakhalin. Water depths for C and K sites are 960 and 860 respectively. Sediment particles are mainly silty clay. Water contents near hydrate bearing depths in sediment cores are approximately 78 and 65 % for C and K sites respectively. Laboratory experiments were carried out to understand the relative stability of natural gas hydrate at these sites, referring to the experimental method and procedure developed by Chuvilin et al, 2002.

Experiments were conducted by using a pressure cell containing sediment samples from C and K sites of which water contents are adjusted to their in situ values. Temperature was kept constant during each test run between 0.8 and 9.8 degree C. Dissociation pressure value of methane hydrate was measured at each temperature condition. Two dissociation curves obtained with C and K samples plotted in PT space are significantly different from equilibrium line for pure methane hydrate (Sloan, 1990), shifting to a higher pressure side. Dissociation pressure values for C and H samples are approximately 0.8 and 0.5 MPa higher than that of pure methane hydrate.