



Free gas in gas hydrate stability zone-data from Okhotsk Sea

X. Luan (1), Y. Jin (2), A. Obzhirov (3), B. Yue (1)

(1) Key Lab of Marine Geology and Environment, Institute of Oceanology, Chinese Academy of Sciences, Qingdao 266071, China, (2) Korea Polar Research Institute, KORDI, Incheon, 406-840, Korea, (3) V.I. Il'ichev Pacific Oceanological Institute of the Far Eastern Branch of Russian Academy of Sciences, Vladivostok 690041, Russia (xluan@ms.qdio.ac.cn/ Fax: 86-532-82898536)

Multidisciplinary field investigations were carried out in Okhotsk Sea by R/V Akademik M.A. Lavrentyev (LV) of the Russian Academy of Sciences (RAS) in May 2006, supported by funding agencies from Korea, Russia, Japan and China. Geophysical data including echo-sounder, bottom profile, side-scan-sonar, and gravity core sample were obtained aimed to understand the characteristics and formation mechanism of shallow gas hydrates. Based on the geophysical data, we found that the methane flare detected by echo-sounder was the evidence of free gas in the sediment, while the dome structure detected by side-scan sonar and bottom profile was the root of gas venting. Gas hydrate retrieved from core on top of the dome structure which was interbedded as thin lamination or lenses with thickness varying from a few millimeters to 3 cm. Gas hydrate content in hydrate-bearing intervals visually amounted to 5%–30% of the sediment volume. This paper argued that gases in the sediment core were not all from gas hydrate decomposition during the gravity core lifting process, free gases must exist in the gas hydrate stability zone, and tectonic structure like dome structure in this paper was free gas central, gas hydrate formed only when gases over-saturated in this gas central, away from these structures, gas hydrate could not form due to low gas concentration.