



Shallow gases and gas hydrate potential in the Western Ulleung Basin, offshore Korea

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Geological and Geophysical study on shallow gases and natural gas hydrates has been performed in the Western Ulleung Basin, offshore Korea.

Piston core samples were taken in order to determine the hydrocarbon gas distribution and potential of the natural gas hydrates. The core sediments show generally high contents of TOC (total organic carbon) which provide favorable condition for generation of biogenic hydrocarbon gases. The concentration of residual hydrocarbon gases measured by headspace techniques in the southern part of the study area indicates that the concentration of gas in pore water is greater than its solubility. The hydrocarbon gases of the core sediments consist mostly of methane except several sites. Based on the hydrocarbon compositions and isotopic ratios, the hydrocarbon gases of the core sediments are identified as biogenic origin. The horizontal cracks which could be formed by gas expansion are observed in the core sediments. The soupy layers were also observed in the core sediments. The soupy layers are not related to the sand layer or other distinct sediments types. Therefore, we believe these layers might be related to the dissociation of gas hydrates.

Based on the multi-channel 2D-seismic data acquired by using Tamhae-2, bottom simulating reflectors (BSRs) are present mainly in the southern part of the study area, but their occurrence is patchy. Vertical to sub-vertical seismic blank zones have also been well identified in the middle part of the study area. The blank zones often show velocity pull-up structures. These upwelling structures are interpreted to be the results of high velocity gas hydrates.