



Distribution and origin of the shallow gases in the Ulleung Basin, offshore Korea

Y. Lee, B. Ryu, J. Kim

Petroleum and Marine Resources Research Division, Korea Institute of Geoscience and Mineral Resources, Daejeon, Korea (yjl@kigam.re.kr/phone: +82 42-86863209)

Chemical and isotopic compositions of hydrocarbon gases in the sediments were analyzed by headspace and void gas methods to characterize the properties of the shallow gases distributed in the Ulleung Basin, offshore Korea. Sediments from the core were also analyzed to determine the characteristics and relationship to shallow gases. Seismic survey data was also examined in this study.

Based on the compositional and isotopic data of the hydrocarbon gases, we can identify two different shallow gas regimes within the Basin. One is biogenic gas dominated regime which is distributed around the central part of the Basin. Relatively high amount of the total organic carbon contents (TOC < 1% in average) provide good condition for generation of biogenic gases in this area. Thermogenic gas is distributed in the Basin margin and specific area. Rock-Eval and carbon isotopic data represent that the level of thermal maturity of organic matter in the core sediments is immature in terms of the hydrocarbon gas generation. It suggests that thermal gases in the sediments would have migrated from the deeper part of the Basin. These gases may be originated from the Tertiary source rocks within the Basin, which also act as a source for the commercial gas field in the Basin. Analyzed gas concentration is over methane saturation in the area of seismic anomalies such as seismic blanking zone or chimney structures in the section. Concentration of hydrocarbon gases in the sediments provides favorable condition for formation of gas hydrate, because pressure and temperature conditions are also within the gas hydrate stability zone.