[JJ] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-IS Intersection

[M-IS17]Gas hydrates in environmental-resource sciences

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An increasing number of researches focusing on natural gas hydrates has recently been conducted from the environmental, material, and resource scientific viewpoints. This session aims to share and discuss the latest research results to understand and examine the nature and potential of gas hydrates in the past-present-future of the Earth. Because the researches on gas hydrates are interdisciplinary, broad topics from field and experimental researches, modeling, etc. will be presented in this session.

[MIS17-P14]Geochemical characteristics of hydrocarbons and ions within gas chimney structures in the Tsushima Basin and the Oki Trough, eastern margin of the Japan Sea

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Keywords:gas chimney, hydrocarbon gas, Japan Sea

Shallow gas hydrate often develops on gas chimney structures associated with mound/pockmarks in the eastern margin of the Japan Sea, however, the distribution and reaction of gas and ion dissolved in pore water inside the chimney is not well understood. We retrieved sediment cores from the well-developed gas chimneys with mound in the southeastern margin of Tsushima Basin and western and eastern Oki Trough to characterize the geochemical compositions of gas and ion, and compare their variations with regional geology including subsurface/thermal structures.

Concentrations of sulfate dissolved in pore waters rapidly decrease with depth to the sulfate-methane interface (SMI). Contrarily, concentrations of methane increase downward from the depth of the SMI. Methane/ethane ratios are low (<100) above the SMI, however, those rapidly increase below the SMI particularly on the mound sites with gas chimney structure. This is because methane was oxidized anaerobically by the sulfate at the depth of SMI and methane was generated by methanogenic bacteria below the SMI. The thermogenic methane generated at greater depth is also dominant at the gas chimney site where the geothermal gradient is generally high, the distribution of deep-sourced materials are significant near the seafloor in these locations.