



## **Occurrence characteristics of hydrates in fine-grained sediments**

Joo Yong Lee (1), Taewoong Ahn (2), Jaehyoung Lee (2), and Sejoon Kim (2)

(1) Korea Institute of Geosciences and Mineral Resources, Daejeon, Korea (jyl@kigam.re.kr), (2) Korea Institute of Geosciences and Mineral Resources, Daejeon, Korea

Hydrate occurrences in sediments are affected by the sediment characteristics in various aspects and scales. The grain-displacing hydrates form in fine-grained sediments since filling pre-existing fractures or inducing frost heaves takes less energy than overcoming capillarity induced inhibition in fine-grained sediments. The geometry of grain-displacing hydrate formed by filling pre-existing fractures are mostly governed by the geometry of fracture, whereas those formed by heaving mechanisms are governed by in-situ stress conditions and geomechanical properties.

The thickness, spacing, dip angle, and number of grain-displacing hydrates have been extracted using X-ray CT images of pressure cores recovered from Ulleug Basin, East Sea, Korea. The thickness of both horizontal and vertical grain-displacing hydrates, and the number of horizontal hydrates decreases with depth (i.e. with the increase of the overburden stress) while the number of vertical hydrates does not decrease with depth, implying that the formation mechanisms of horizontal and vertical hydrates differ while growth mechanisms are similar to each other in different growth directions.