EXPERIMENTAL STUDY ON SEISMIC WAVE VELOCITY OF HYDRATE-BEARING SEDIMENTS - RESULTS ON THE SEDIMENT FROM THE ULEUNG BASIN, EAST SEA, OFFSHORE KOREA

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ABSTRACT
Synthesizing gas hydrate in a fine-grained natural seabed sediment sample, mainly composed of silty-to-clayey soils, has been hardly attempted due to the low permeability. It has been known that hydrate loci in pore spaces and heterogeneity of hydrate growth in core-scale play a critical role in determining physical properties of hydrate-bearing sediments. In the presented study, we attempted to identify the effect of hydrate growth morphology on seismic velocities in natural fine-grained sediments sampled from the Uleung Basin in East Sea. We synthesized CO₂ hydrate in clayey silt sediments in an instrumented oedometric cell and measured seismic velocities during hydrate formation and loading processes. Herein, we present the experiment results on P-wave and S-wave velocities of gas hydrate-bearing fine-grained sediments. It is found that geophysical properties of gas hydrate-bearing sediments are governed by hydrate saturation and effective stress as well as morphological feature of hydrate formation in sediments.

Keywords: gas hydrate, elastic waves, effective stress, fine-grained sediment, hydrate saturation

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