

## 가스 하이드레이트 부존 퇴적토의 지반공학적 물성

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### Geotechnical properties of gas hydrate bearing sediments

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Large amounts of natural gas, mainly methane, in the form of hydrates are stored on continental margins. When gas hydrates are dissociated by any environmental trigger, generation of excess pore pressure due to released free gas may cause sediment deformation and weakening. Hence, damage on offshore structures or submarine landslide can occur by gas hydrate dissociation. Therefore, geotechnical stability of gas hydrate bearing sediments is in need to be securely assessed. However, geotechnical characteristics of gas hydrates bearing sediments including small-strain elastic moduli have been poorly identified. Synthesizing gas hydrate in natural seabed sediment specimen, which is mainly composed of silty-to-clayey soils, has been hardly attempted due to their low permeability. Moreover, it has been known that hydrate loci in pore spaces and heterogeneity of hydrate growth in specimen scale play a critical role in determining physical properties of hydrate bearing sediments. In the presented study, we synthesized gas hydrate containing sediments in an instrumented oedometric cell. Geotechnical and geophysical properties of gas hydrate bearing sediments including compressibility, small-strain elastic moduli, elastic wave, and electrical resistivity are determined by wave-based techniques during loading and unloading processes. Significant changes in volume change, elastic wave, and electrical resistivity have been observed during formation and dissociation of gas hydrate. Experimental results and analyses reveal that geotechnical properties of gas hydrates bearing sediments are highly governed by hydrate saturation, effective stress, void ratio, and soil types as well as morphological feature of hydrate formation in sediments.

**Key words** : Gas hydrate(가스 하이드레이트), Gas hydrate bearing sediment(가스 하이드레이트 부존 퇴적토), Geotechnical property(지반공학적 물성), Geophysical property(지구물리학적 물성)

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