

Recovery and hydrate estimate of gas hydrate bearing sediments by pressure coring tool PCTB and onboard core handling system PCATS

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Multi-hole drilling/coring was conducted on 3 hydrate mounds/gas chimney structures in Oki trough and off Joetsu in August to November, 2015, with an intention to reveal the distribution and amount of shallow gas hydrates in gas chimney structure. On the basis of the results of 2014 drilling campaign, the pressure coring system of Geotek LTD composed of coring tool PCTB and core handling system, PCATS, installed onboard the drill ship. PCTB is designed to recover pressurized gas hydrate bearing sediment cores of 2.5 m long and 5.1cm in diameter, and 2015 campaign recovered 32 PCTB cores with in situ pressure in 42 deployments. Immediately after the core recovery on deck, PCTB cores were transferred to PCATS (Pressure Core Analysis and Transfer System) for transparent X-ray imaging, Gamma-ray density and Vp logs to roughly identify the lithology and occurrence of hydrates. Then, the pressurized cores were cut into 2 to 5 sections for detailed measurements and for shore-based analysis. Quantitative degassing experiments to measure total amount of hydrate gas has provided the precise volume% of hydrate in the section. After degassing, waters of the section were squeezed to measure chloride and sulfate concentration. Chloride concentration of the pristine IW is calculated from hydrate amount (vol%) and measured water chemistry, assuming that the squeezed water is a mixture of pristine IW, hydrate water (Cl and SO₄ = zero) and sea water contamination (Cl=559mM, SO₄=28.9mM). Cl of the pristine IW provides the baseline to estimate the amount of hydrate in nearby sections and cores from squeezed "IW" waters. We also report the occurrence, micro-texture and estimated amount of gas hydrate in pressure cores. This study was conducted as a part of the shallow methane hydrate exploration project of METI. We express our thanks for allowing us to present this paper.

Keywords: Pressure coring, gas hydrate amount