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

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

convener:Hitoshi Tomaru(Department of Earth Sciences, Chiba University), Akihiro Hachikubo(Kitami Institute of Technology), Atsushi Tani(神戸大学　大学院人間発達環境学研究科, 共同), Shusaku Goto(Institute for Geo-Resources and Environment National Institute of Advanced Industrial Science and Technology)
Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
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-P15]Anomalously high porosity and the implication of overpressure in shallow gas-hydrate-bearing sites in eastern India

*Wataru Tanikawa[1], Takehiro Hirose[1], Yohei Hamada[1], Lallan Prasad Gupta[1], Yuka Masaki[2], Weiren Lin[3], Naokazu Ahagon[1], Natsue Abe[2], HungYu Wu[2], Takamitsu Sugihara[2], Shun Nomura[2], Masataka Kinoshita[4], Yasuhiro Yamada[2], JAMSTEC Science Team NGHP Expedition 02 [2] (1.Japan Agency for Marine-Earth Science and Technology, Kochi Instutute for Core Sample Research, 2.Japan Agency for Marine-Earth Science and Technology, 3.Kyoto University, 4.Tokyo University)
Keywords:overpressure, gas-hydrate, porosity, permeability, National Gas Hydrate Program Expedition 02, Krishna-Godavari Basin

Porosity–depth decay curves in four sites from the Krishna–Godavari Basin in eastern India showed higher porosity values than in the predicted normal consolidation curves at greater depths. The higher porosity values were probably due to overpressure generation and maintenance. This pore pressure excess at greater depths influences the depths and widths of gas-hydrate-bearing layers.
Consolidation tests of core samples showed overconsolidation of core samples at shallower depths, which can be explained simply by the effect of past maximum stress. However, the curves were consistent with normal consolidation curves at greater depths. Permeability of mud in four sites was quite low, which decreases from 10^{-17} to less than 10^{-18} m^2 from 0.5 to 5 MPa, respectively. Therefore, continuous overburden loading in low permeable sediments is the primary cause of overpressure.
Comparing the channel-filled site with c, the former is more consolidated and has less generated excess pore pressure than those normal slope site. This variation is probably induced by differences in grain size, where coarser-grained sediments are more abundant in channel sites than in slope sites. This is because coarser-grained particles are easier to compact owing to their smaller specific surface area and higher permeability.
The porosity–decay curves are well fitted by modified exponential decay curves, in contrast to the traditional Athy’s law; therefore, we recommend this modified decay curve for predicting porosity–depth curves and pore pressures, especially in shallow argillaceous sediments.