The Microstructure of Nankai Trough Methane hydrate sediments by Scanning Electron Microscope

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The microstructure of the eastern Nankai Trough methane hydrate bearing sediments was observed by Field Emission Scanning Electron Microscope (FE-SEM; JEOL JSM7000F) with a low-vacuum system. Advantage of this system does not need any coat on sample so that the sample can be analyzed by an energy dispersive X-ray detector (EDX-detector; JEOL JED2300F). Also, for hydrate observation, a cryostat system (Gaton Alto 2000) was installed.

Using these systems, we observed internal pore structure change of methane hydrate bearing sediments before/after methane hydrate dissociation, microscopically. Especially, we observed the surface morphology changes during dissociation process, i.e. increasing temperature from 80K to 180K, at 10Pa pressure.

Results of observation, surface of ice or hydrate both had been dissociated unevenly. This structure implies that methane hydrate exists as not mono crystal but aggregation of micro crystals.