Change processes of microfabrics in the Nankai Trough muddy sediments from several centimeters through several hundreds meters in burial depths

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Microfabrics in deep-sea sediments prior to incorporation in an accretionary prism give us important visual information for deformation fabric analyses. Analyses of primary sedimentary fabrics and compaction processes of deep-sea sediments are a key to understanding formation processes of the decollement zone. This paper discusses the microfabric development processes of unconsolidated hemipelagic sediments and mass transport deposits (MTDs) during early diagenesis from deposition, burial compaction-cementation, and deformation by means of microfabrics observations and physical/mechanical property measurements using drilling core samples and submersible samples as follows.
1) The submersible samples were collected from the landward trench slope in the Nankai Trough using a MBARI-type corer. The water depths were from 2500 to 3000 m. The sediment cores of 3K#1345C-1, -2, -3, -4 and 3K#1346 C-1 were mostly 20 cm in length. We measured physical and mechanical properties in the core sediments.
2) The drilling core samples were collected in the Nankai Trough using a Hydroric piston corer. The water depths were from about 3000 m. The sediment cores of C0018A were 314.5 m in length. C0018A is divided into Unit IA is composed Hemipelagic mud layer that is frequently volcanic ash layer is sandwiched between and six MTD layer volcanic ash layer is caught. Unit IB is composed of a sandy turbidite layers. In addition, it deals only Unit IA in this announcement. Mechanical properties in the core sediments were used on board data.
The main objective of this paper is to understand the microfabrics changing processes in the Hemipelagic sediments from several centimeters to several hundreds meters in depth during long-term burial compaction. The burial compaction processes have been mainly studied using consolidation tests in laboratories for a short-term, although, sediments are consolidated gradually during geologic time as an age effect. Microfabrics changing processes by age effects are not well understood. Hemipelagic sediments are the best examples for long-term compaction study, because they have mostly constant sedimentation rates through geologic time and homogeneous structures and components.
The samples for microfabrics observation were treated by freeze-drying and embedding methods in order to avoid volume shrinkages by air-drying. The microfabrics in the Hemipelagic sediments and MTDs are mainly constituted of clay aggregations (ped) and clay linkages (connector) as shown in below.
1) In the Hemipelagic mud layers, the microfabrics are characterized by a horizontal preferred orientation of clay flakes in Face-to-Face contact.
2) In the MTD layers, most of the clay flakes constitute in regular/irregular aggregations. The regular aggregations range from 1 to 5 μm and irregular aggregations are larger than 20 μm in diameter.

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