

Mesosopic and microscopic characterization of fractures in the accretionary prism from the view point of mass transfer

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Since the accretionary prism widely spread in Japan, understanding the groundwater and mass transfer behavior along the fracture is crucial from the view point of geological disposal. We have carried out mesoscopic and microscopic observation of Neogene and Pre-Neogene accretionary prism. Misaki formation in the Miura group at Jogashima of the southern end of the Miura peninsula has been selected for the Neogene accretionary prism, and Chichibu formation in the Kanto Mountain has been selected for the pre-Neogene accretionary prism, respectively.

In the Neogene accretionary prism, clay materials are observed in the fault core at the center of the major fault which is E-W trending at the Jogashima area. Subordinate faults are observed on both sides of the major fault as a damaged zone. Most of the subordinate faults in the field are planeless fault which represents adhesion of two fault planes. Open fracture and/or crushed fragments with void can be observed along the planeless fault under the scattered electron microscope. So the planeless fault could be the conductor, on the other hand, fault core along the major fault could not be the conductor.

In the pre-Neogene accretionary prism, melange characterized by the block-in-matrix structure can be observed at the river bed. Scaly cleavage with aperture along the preferred orientation in the argillaceous matrix is clearly observed. A few micrometer scale voids with crushed fragments can be observed along the cleavage which is formed as primary deformation structure. Another fracture cutting through high angle to the primary structures are filled with minerals. So the primary deformation structure would not be conductor, whereas the secondary fracture with aperture could be the conductor.

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