

Permeability Structure of the Miura Group and Internal Structures of Tsurugizaki Anticlinal Zone

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Shallow portion of accretionary prism is exposed well in Miura Peninsula, and we studied permeability structure of Miura Group to determine transport properties of shallow accretionary prisms. We also analyzed internal structures of Tsurugizaki anticlinal zone to understand deformation processes in the accretionary prism.

We measured the permeability and porosity in the confining pressure condition of samples taken from all formations of the Miura Group. Compared the permeability between sandstone and siltstone, the permeability of sandstone tend to show higher by the effect of bigger particle size. The older the sedimentation age is, the lower permeability each specimen show. One reason is that the difference of the maximum burial depth makes the difference of the maximum undergoing confining pressure. Other reason is time dependent compaction effect under the geological time scale. The porosity decreases constantly with increasing the effective pressure. The storage capacity shows approximately constant in every formation and does not relate with age and grain size.

In the subducting process, sediments undergo intense deformations, and then many cracks exist in these rocks. To examine the effect of these deformations against the permeability, I compared the permeability of the specimen deformed at the atmosphere with the non-deformed specimen. As a result of this, when the specimen before deformation experiment shows relatively low permeability, the specimen after deformations shows higher permeability than the non-deformed specimen under every confining pressure. When the specimen before deformations shows relatively high permeability, the specimen shows approximately same permeability regardless of deformations. The former is that it is because cracks caused by deformations function as a fluid pass and the latter is that it is because the permeability of the specimen shows higher than one of these cracks caused by deformations. Thus we find that the effect of deformations against the permeability depends on rocks initial permeability.

We examined Tsurugizaki anticline to determine internal structures in shallow accretionary prism. In the Misaki Formation which is lower part of Miura Group, there is Tsurugizaki anticline which shape looks complicated. In the previous studies, Tsurugizaki anticline had been treated as a simple anticline structure, but actually complicated structures internally exist in the Tsurugizaki anticline. So we need to reconsider about this anticline. In the Tsurugizaki anticlinal zone, the shape of folds and deformation structures were studied in view of Miura Group as shallow parts of accretionary prisms. Along the Tsurugizaki anticline there are 11 fold structures. These folds trend same EW direction and in dips divided into E and W direction. At each fold boundary comparatively big scale fault exists. We found that in shallow accretionary prism there are the mixtures of folds which trend approximately same direction and many ruptures.