Ocean floor metamorphism recorded in the Taitao ophiolite

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Ocean floor metamorphism is important process of interaction between sea-water and oceanic crust, namely surface environment and solid earth. We reconstructed a complete section of oceanic ridge emplaced near the Chile Triple Junction based on the geological investigation of the Miocene-Pliocene Taitao ophiolite (Anma et al. 2003).

The Taitao ophilolite consists of harzburgite, massive and layered gabbro, sheeted dike complex and sequence of pillow lavas and sedimentary rocks in ascending order from the south. These sequences generally strike east-west and dip to the north. Our results revealed that a major shear zone is present between harzburgite and 4 Ma arc-derived granitoid in the south. The thickness of harzburgite is about 1 km. The harzburgite and overlying gabbros are folded into complex pattern together, and the boundary between them is mainly tectonic. The gabbro is about 3 km thick. Sheeted-dike complex has two types of intrusions with different directions; NNE-SSW trending in the northern block, and NW-SE trending in the southern blocks. Piles of pillowed basalts and terrigenous sediments with westward younging were inferred to be associated with sheeted-dike complex of the northern block. (Anma et al. 2004).

Observation of thin sections and analysis by electronprobe microanalyser revealed that metamorphic grade ranges from zeolite facies, throuth the greenschist facies, to amphibolite facies, and increases progressively downwards. The zone boundaris are subparallel to the lithostratigraphy. Metamorphic facies series of the Taitao ophiolite corresponds to the low-pressure type. According to our results, ocean floor metamorphism is well-preserved in the Taitao ophiolite.