

## A very hydrous mantle under the western Pacific: implications to formation of marginal basin and style of Archean plate tectonics

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The western Pacific region has been refrigerated by the subducting cold oceanic plates since 450 Ma. But, the region is also characterized by the presence of many oceanic microplates and active magmatism. We have compiled and examined petrochemical characters of drilled basalts from the Philippine Sea plate, and concluded that the source mantle is rich in water ca. 0.2 percent, and is 50-60 C lower than that for MORB. The extensive melting is due to the high water content in the source mantle. Both the correlation of greater age-residual depth from mid-oceanic ridge and presence of many small microplates there can be explained by high water content of the mantle under the western Pacific. Moreover, the latter may be analogous to Archean plate tectonics, characterized by the hotter mantle.

The western Pacific region has been refrigerated by the subducting cold oceanic plates since 450 Ma. However, the region is also characterized by the presence of many oceanic microplates less than 1300 km across, as well as active magmatism. The Philippine Sea plate is a representative one. We have compiled and examined petrochemical characters of drilled basalts from the Philippine Sea plate, and concluded that the source mantle for oceanic basalts is rich in water ca. 0.2 wt percent, and is 50-60 C lower than that for MORB. The extensive melting is due to the high water content in the source mantle.

It is well known that some marginal basins apparently have greater depths than the major oceans (Tamaki and Honza, 1991), but the origin of the difference is still controversial. Assuming 3.43 and 3.3 g/cm<sup>3</sup> for densities of lithosphere and asthenosphere, we calculated the age-depth correlation based on model of transient half-space cooling, at given parameters of temperatures of mantle and surface, 1280 and 0 C,