

Subduction conditions estimated from the P-T paths for the Sambagawa metamorphic rocks

Kazuhiko Ishii^{1*}

¹Graduate School of Sciences, Osaka Prefecture University

Petrologically derived P-T conditions for high P/T-type Sambagawa metamorphic rocks show lower P/T ratio than numerically modeled typical steady state temperature distribution along the surface of subducting slab. To explain this discrepancy, several authors have proposed the idea of subduction of very young slab that may involve a subduction of spreading ridge (Iwamori, 2000; Aoya et al., 2003; Okudaira & Yoshitaka, 2004). I examined the thermal effects of ridge subduction on both subduction- and exhumation-stage PT-path by a two-dimensional thermal calculation. The results show that PT-path for eclogite and lower-grade metamorphic rocks can be reproduced by a subduction and exhumation of rocks just before the ridge subduction.

Garnet-bearing ultramafic rocks in the Higashi-akaishi peridotite show progressive PT-path up to UHP condition with high dP/dT ratio (Enami et al., 2004). A numerical calculation shows that this PT-path can be explained by a mantle wedge dragged down by the subducting oceanic slab with older age (>20 Ma) and fast (>10 cm/yr) subduction rate.

These two results indicate that UHP and lower-grade metamorphisms are occurred different time and different subduction conditions.

Keywords: plate subduction, Sambagawa metamorphic rocks, P-T path, thermal modeling