

Zircon Nano-SIMS U-Pb dating from the country gneiss beside Horoman peridotite, Hokkaido, Japan

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Hidaka Metamorphic Belt, Hokkaido, Japan includes the youngest granulites and the Horoman peridotite complex in the highest grade zone. Age of the Hidaka gneiss and amphibolite have been determined by various methods (e.g. K-Ar, U-Pb, Rb-Sr and etc). However, the age of Horoman peridotite complex has not been determined yet. Only Yoshikawa et al (1993) reported the cooling age of the complex as 23 Ma based on whole rock Rb-Sr isochron method. This study performed U-Pb dating of zircons from the paragneiss surrounding the Horoman peridotite complex in order to determine the intrusive age of the Horoman peridotite complex from the upper mantle into the lower crustal conditions. The zircons have detrital cores and thin rims (<20 microns). Therefore we used Nano-SIMS because it is possible to focus the secondary beam diameters down to submicrons for the analysis. As a result of this measurement, rim ages of the zircons show that ²³⁸U-²⁰⁶Pb age are 7-11Ma (n=7) and detrital core ages show 25.6 Ma, 34-35 Ma, 78 Ma and 150 Ma (n=8). The rim ages are the youngest in Hidaka metamorphic rocks and there is a discrepancy with zircon rim ages (19Ma) from the granulite (Kemp et al. 2007; Usuki et al. 2006). The present rim ages (7-11 Ma) fit well with the tectonic scenario of the collision process of Hokkaido Island proposed by Yamamoto et al. (2010). It is considered that the Horoman peridotite complex was juxtaposed onto the Hidaka metamorphic belt at 7-11Ma by the subducting Pacific plate after the collision between North American and Eurasian plates.

Keywords: Zircon, U-Pb, Nano-SIMS, Horoman peridotite, country gneiss, juxtaposition age