

SHRIMP U-Pb zircon dating of garnet gneiss from the Lutzow-Holm Complex at Langhovde, East Antarctica

Mutsumi Kato^{1*}, Yoshikuni Hiroi¹

¹Graduate School of Science, Chiba University

The Lutzow-Holm Complex of East Antarctica is one of Pan-African metamorphic terranes that formed as a part of the East Gondwana supercontinent amalgamation. The LHC is considered to have experienced a typical clockwise pressure-temperature-time path, as indicated by the presence of relict kyanite and staurolite inclusions within garnet and plagioclase in sillimanite-rich pelitic granulites and the development of reaction textures characteristic of near-isothermal decompression in mafic to ultramafic rocks (e.g., Hiroi et al., 1991). The timing of peak regional metamorphism within the sillimanite stability field is constrained to be 520-550 Ma by SHRIMP U-Pb dating on zircon (Shiraishi et al., 1994).

Hiroi et al. (2008) found magmatic andalusite in garnet-bearing pegmatite for the first time from the granulite facies Langhovde area of the LHC. The andalusite-bearing pegmatite intrudes garnet-biotite-sillimanite gneiss, and between them, garnet gneiss that does not contain both andalusite and sillimanite is sometimes formed. In order to constrain the timing of andalusite formation, we performed an ion microprobe (SHRIMP) dating of zircons in the garnet gneiss, and obtained an apparent population of U-Pb ages at ca. 525 Ma, that is almost contemporaneous with the timing of peak metamorphism in the LHC. We discuss the significance of the zircon U-Pb age from the garnet gneiss.

References

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