SHRIMP U-Pb zircon ages in the central part of the Hidaka Metamorphic Belt, Hokkaido, northern Japan - A preliminary report

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The Hidaka Metamorphic Belt (HMB) in Hokkaido Island is a high temperature type metamorphic belt formed in Tertiary. However, there is controversy for the timing of the peak metamorphism and the thermal history in the HMB because of the inconsistency of geochronological data; 55-56 Ma of Rb-Sr whole-rock ages (Owada et al., 1991, 1992) and 17-23 Ma U-Pb zircon ages by a conventional method (Kimbrough et al., 1994) and SHRIMP dating (Watanabe et al., 1994).

Owada et al. (1997) discussed that the timing of the peak metamorphism and anatexis in the HMB is 55-56 Ma based on Rb-Sr whole rock isochron obtained from pelitic granulite and Opx tonalite in the central and southern part of the HMB and 17 Ma of U-Pb age by Kimbrough et al. (1994) was considered to be a cooling age passing the closure temperature of zircon. On the other hand, Kimbrough et al. (1994) argued the 17 Ma granulite facies overprint and rapid uplift.

Recently, many authors have discussed that Sr isotopes are not completely reset during

anatexis(e.g.Hammouda et al., 1996,Tommasini and Davies, 1997). However, the previous zircon U-Pb data in the HMB were obtained from only a few localities along Hidakahorobetsu River. Therefore, we need regional and systematic U-Pb geochronological data to compare with Rb-Sr data from the extensive area in the HMB.

In this study we are performing U-Pb dating of zircon separated from systematically collected pelitic granulites in the central part of the HMB using SHRIMP II at National Institute of Polar Research.

In the preliminary work, two pelitic granulites corrected from Sasshibichari R. (SSM05) and Menashunbetsu R. (MS93-1) were analyzed. SSM05 and MS93-1 are consist of alternations of coarse-grained leucosomes and medium- to fine-grained mesosomes. Leucosomes of both samples mainly consist of plagioclase, quartz, cordierite and minor amount of garnet and biotite. Mesosomes mainly consist of garnet, cordierite, biotite, plagioclase and quartz. Zircon and apatite is major accessory minerals, and many of zircons are observed in mesosome bioite or grain boundaries.

In cathodoluminescence image observation of separated zircons, almost grains from pelitic granulites in the HMB show isometric (roundly zoned) overgrowth texture with inherited core, which is a characteristic of zircon in pelitic granulite underwent anatexis (e.g. Vavra et al., 1999).

The overgrowth rim and a clear prismatic grains yield 17.5-20 Ma, and ~180 Ma was obtained from an inherited core. This indicates the young U-Pb ages of zircon are a characteristic of granulites in the central part of HMB and interpreted as the timing of anatexis.