

Petrology and geochronology of metamorphic rocks in the Bayankhongor area, the central part of Mongolia.

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Mongolia is situated in the Central Asian Orogenic Belt (e.g. Mossakovsky et al., 1993), which extends from the Siberian craton, Baltica craton, North China craton and Tarim craton. It is composed of subduction-accretion complexes and developed from c. 1000 Ma to c. 250 Ma (Windley et al., 2007). Metamorphic rocks are partly distributed in the central and western part of Mongolia. Metamorphic history would be a key for understanding the tectonic evolution of this area, however detailed study on metamorphic rocks has not been well-documented, including geochronology. In this study, we report petrology and U-Pb monazite and zircon ages on metamorphic rocks occurring in the Bayankhongor area.

The Bayankhongor area is situated between Gobi-Altai range and Hangay range in the central part of Mongolia. The area is mainly composed of granitic gneisses (biotite gneiss and clinopyroxene-biotite gneiss), amphibolites and pelitic gneisses. Pelitic gneisses are classified into garnet-biotite gneiss, garnet-sillimanite-biotite gneiss and garnet -cordierite-biotite gneiss. Garnet in garnet-cordierite-biotite gneiss is replaced by cordierite and biotite, indicating decompression process. Sillimanite in garnet-sillimanite-biotite gneiss is replaced by andalusite, which also indicates later stage metamorphism under the lower pressure condition. Amphibolites are classified into garnet-amphibolite, clinopyroxene-amphibolite and amphibolite. Garnet in garnet-amphibolite is replaced by plagioclase and hornblende, which qualitatively imply decompression as well as pelitic gneisses. Thus, metamorphic rocks in the Bayankhongor area widely recorded amphibolite- to upper amphibolite-facies metamorphism with subsequent decompression.

In the presentation, we show additional data including mineral chemistry, P-T estimations and U-Th-Pb in situ dating and discuss metamorphic evolution of the Bayankhongor area. Based on the interpretation of those data, we suggest its implication for the tectonic process related to the development of the Asia continent.

References

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