Geochronology and geological implications of the Mengku plagiogranite pluton in Altay, Xinjiang

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The Altai Mountains are a key area for understanding the development of the Altai Tectonic Collage and accretionary orogen. In this work, we undertake zircon U-Pb dating of two Paleozoic synorogenic plutons in order to better define the early magmatic and tectonic evolution of the Chinese Altai Mountains. SHRIMP U-Pb zircon dating on the Mengku plagiogranite pluton in the Mengku iron deposit district in Xinjiang shows that it was formed at 400 ±6 Ma (MSWD=1.3). This age is similar to biotite granite at the north part of the No. 1 orebody (SHRIMP U-Pb dating is 404 ± 8 Ma), indicating that they were formed at the beginning of the Early Devonian.

The Altay area is an important metallogenic province characterized by Early Devonian Kangbutiebao Formation marine volcanic rocks hosting Cu, Pb, Zn and Fe deposits. However, the absolute timing of Kangbutiebao Formation cannot be well constrained by the isotopic dates. These plutons intrude Kangbutiebao Formation, showing that Kangbutiebao Formation could have been much earlier than 404 Ma. We think that the Kangbutiebao Formation formed in the Late Silurian. The Mengku large scale iron deposit is related to magmatic hydrothermal activity, and the ages of the plutons shows that iron mineralization formed in slightly later than 404-400 Ma.

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From back-arc basin to back-arc foreland basin: Evidences from trace and Rare Earth Elements of the Early Ordovician and Early Silurian sandstones of Jingtai, Eastern North Qilian, China

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The Early Ordovician and Early Silurian are the key periods for the evolution of tectonics in North Qilian Caledonian orogenic belts. The trace and rare earth elements of sandstones from Lower Ordovician Yingou Formation and Lower Silurian Angzanggou Formation in Jingtai area were presented. The samples from lower part of Yingou Formation are characteristic of minimal Eu/Eu* (0.54) and maximal Th/Sc (2.05), ∑REE (204.38), and contrast with the middle-upper part of Yingou Formation possessing maximal Eu/Eu* (0.91) and minimal Th/Sc (0.07), ∑REE (41.63), and intermediate Eu/Eu* (0.62), Th/Sc (1.21), ∑REE (164.43) for those of Angzanggou Formation. Diverse plots of provenance and tectonic setting discrimination and multi-element diagrams show that (1) the lower part of Yingou Formation is mainly derived from recycled sedimentary and felsic sources positioned in continental margin and other recycled terrigenous sediments with a comparable property to the former; the middle-upper part indicates a dominate derivation from mafic-andesitic sources in a island arc environment, and is corresponding to the early stage of Shihuigou Arc; (2) the tectonic setting of Anagzanggou Formation is delusive caused by the coexistence of continental island arc, active continental margin and passive continental margin due to the mixing of the detritus from these provenances, and may source from the metasedimentary rocks locating in the south margin of Alashan Block, the island arc volcanic rocks with middle-high maturity in Shihuigou area and the ancient metavolcanic rocks. The results suggest an evolution from back-arc basin of the Early Ordovician to back-arc foreland basin in the Early Silurian.

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