

**SIMS U-Pb ages and
geochemistry of newly
discovered Neoproterozoic
orthogneisses in the Jiamusi-
Khanka Block, northeast China:
Constraints on high-grade
metamorphism and tectonic
affinity**

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The Jiamusi-Khanka Block, located in the easternmost segment of the Central Asian Orogenic Belt (CAOB), is one of the least understood blocks in northeastern China. The ages of its basement rocks, timing of high-grade metamorphism, and tectonic affinity of this block have been controversial. In this contribution, we report newly discovered Neoproterozoic orthogneisses from the Mishan region in the central Jiamusi-Khanka Block. The SIMS U-Pb dating reveals that magmatic zircon cores from one high-grade orthogneiss yield a weighted mean ²⁰⁷Pb/²⁰⁶Pb age of 898 ± 4 Ma and an upper intercept age of 892 ± 12 Ma, indicating that early Neoproterozoic magmatism did occur in the Jiamusi-Khanka Block. Metamorphic zircon rims or single grains from the same sample give two group ages with one around ca. 567 Ma, interpreted as the timing of the high-grade metamorphism, and the other around 518~496 Ma, interpreted as the timing of a subsequent retrograde metamorphism. The metamorphic syenogranites have SiO₂ = 71.29–78.08 wt. %, A/CNK = 1.06–1.99, and Na₂O/K₂O = 0.03–1.49, chemically belonging to high-potassium calc-alkaline series and are peraluminous syn-collisional granites in nature. They have low Sr (32–134 ppm) content and Sr/Y ratio (1.6–16.9), and display strongly fractionated to nearly flat REE patterns with negative Eu anomalies (δEu = 0.22–0.95) and Nb-Ta depletions. These geochemical characteristics suggest that the syenogranitic rocks were probably derived from a crustal source with high proportion of sedimentary rocks under low pressure, perhaps in a subduction-related transitional setting from extrusion to extension. In the context of reconstruction of Gondwana, the first reported ca. 895 Ma magmatic rocks and ca. 567 Ma high-grade metamorphism in the Mishan region provide further constraints on the possible linkage between the Jiamusi-Khanka Block and East Gondwana during Neoproterozoic to early Paleozoic period.