Age of the Kelameili ophiolite in Eastern Tianshan: LA-ICP-MS U-Pb zircon Dating

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Being an important complex unit along the Kelameili default, Kelameili ophiolite mainly consists of serpentinized peridotite, pyroxenite, gabbro and silicolite, etc. It is located between the eastern Junggar (the North) and a southward subduction zone beneath the eastern Tianshan; the latter is defined by the Harlik-Danahu arc in the eastern Qinling Mountains, West China [1,2].

Determining the time of the Kelameili opholite is very important for understanding the evolution of Eastern Tianshan area. Previous dating results however, range from late Devonian to early Permian, displaying a large span. That led to various models to reconstruct the Tianshan orogenic belt in early Paleozoic.

Here we show LA-ICP-MS dating results for single zircon grains of gabbro from the Kelameili ophiolite, which yield 352 ± 3Ma. Those zircon grains are small in size (30-100μm) and idiomorphic. Cathodoluminescence images show obvious magmatic oscillatory zoning. The U and Th concentrations vary from 30ppm to 278ppm, with high Th/U ratios (> 0.3), also suggesting their typical magmatic origins. The new-determined age definitely indicates that the gabbro from the Kelameili ophiolite was formed in the early Carboniferous, which gives a valid constrain on the formation of the Kelameili ophiolite.

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[1] Ma *et al*.. (1997) *House of Nanjing Univ*., 2, 25. [2] Xiao *et al*.. (2004) *J. Geol. Soc*., London, 161, 339-342.

Petrology, P–T–t path, and geotectonic significance of high-pressure mafic granulites from the Jiaobei terrane, North China Craton

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High-pressure (HP) mafic granulites in the Jiaobei terrane are composed predominantly of garnet–bearing mafic granulites, garnent–hypersthene granulites, and garnet amphibolites, and they are found as irregular lenses or deformed parallel dykes within tonalitic–trondhjemitic–granodioritic gneisses or granitic gneisses. The HP mafic granulites cantain four distinct metamorphic assemblages of which the early prograde assemblage (M_1) is represented by the cores of garnets, together with mineral inclusions of clinopyxene + plagioclase ± quartz, and it formed at 740–770 °C and 0.90–1.00 GPa. In contrast, the peak assemblage (M_2) consists of high-Ca cores in garnet, high-Al cores in clinopyroxene, and high-Na cores plagioclase in the matrix, which formed under P–T conditions of 850–880 °C and 1.45–1.65 GPa. The peak metamorphism was followed by near-isothermal decompression (M_3), which resulted in the development of orthopyroxene + clinopyxene + plagioclase ± quartz ± amphibole ± magneitite symplectites or coronas surrounding some garnet grains with P–T conditions of 780–830 °C and 0.65–0.85 GPa. Surrounding some garnet grains are symplectites of amphibole + plagioclase + quartz ±magneitite, which formed during a cooling retrograde stage (M_4) with P–T conditions of 590–650 °C and 0.62–0.82 GPa.. The combination of petrography, mineral compositions, metamorphic reaction history, thermobarometry, and geochronology defines a near-isothermal decompressional clockwise P–T path for the Jiaobei HP mafic granulites, suggesting that the Jiaobei terrane underwent initial crustal thickening, followed by relatively rapid exhumation, cooling, and retrogression. This tectonothermal path was probably generated by subduction and collision-related tectonic processes.

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