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**High-temperature metamorphism of the Yushugou ophiolitic slice:  
Late Devonian subduction of seamount and mid-oceanic ridge in the  
South Tianshan orogen**

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**Abstract**

The South Tianshan Orogenic Belt (STOB), representing the southern segment of the Central Asian Orogenic Belt (CAOB), underwent a long-lived and subduction-related accretionary orogenic process. Revealing the petrogenesis of high-pressure (HP) metamorphic ophiolitic slices within this orogen is of crucial importance to understanding the geodynamic evolution of the STOB. In this study, we carry out a petrological, geochemical and geochronological study of HP mafic granulites from the Yushugou ophiolitic slice within the South Tianshan Accretionary Complex. Our results combined with previously published data suggest that the Yushugou mafic granulites, including garnet-clinopyroxene granulite, garnet two-pyroxene granulite and garnet-orthopyroxene granulite, are generally subalkaline to alkaline basalts, and show geochemical characteristics of MORB and OIB. The nominally anhydrous minerals of the mafic granulites contain certain but trace amounts of water in the manner of structural OH and sub-microscopic fluid inclusions. The granulites have a possible protolith age of ca. 400 Ma and metamorphic age of 390–360 Ma, and underwent HP and high-temperature (HT) granulite-facies metamorphism under conditions of 12–14 kbar and 840–950 °C and low H<sub>2</sub>O activity.

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