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# Early Paleozoic Crust-Mantle Interaction in the Eastern Section of East Kunlun: Geochronological, Geochemical Evidence and Tectonic Implications of Mailong Granites

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The Silurian magmatic rocks of the East Kunlun Orogen are of great significance in determining the collisional evolution process of the protoTethys Ocean. In this study, the petrographic, chronological, geochemical and Hf isotope analyzes were carried out for Mailong granodiorite and monzogranite exposed in the Gouli area of the eastern section of the EKOB, and the rock genesis and formation were discussed accordingly construction background. The results show that the zircon weighted mean ages of Mailong monzonite and granodiorite are 438 ± 3 Ma and 426 ± 2 Ma. The granodiorite is characterized by high silic, enrichment of alkaline, but depletion in calcium, magnesium, titanium and phosphorus. The A/CNK values range from 1.01 to 1.08. The rock is obviously enriched in large ion lithophile elements and depleted in high field strength elements, with negative Eu anomalies. The zircon $\varepsilon_{Hf}$ (t) value has a wide range (from -3.54 to -0.56), and the two-stage mode age $T_{2DM}$ (Hf) is 1805 to 592 Ma. The granodiorite is characterized by high aluminum, High strontium content, High Sr/Y and (La/Yb) N ratio and lower yttrium content. The total amount of rare earth elements in the rock is low, the differentiation between light and heavy rare earth elements is obvious, with positive Eu anomaly characteristics. $\varepsilon_{Hf}$(t) ranges from- 4.9 to - 0.7, and the two-stage model age $T_{2DM}$ (Hf) is 1559 to 1332 Ma. The monzonite showing characteristics of highly fractionated I-type granites, It is formed a high degree of separation and crystallization after the mixing of felsic magma in the lower crust and mafic magma in the mantle. But the granodiorite has the characteristics of adakite , it is formed by subsequent crystallization after partial melting of the thickened juvenile lower crust and. Combined with new regional studies, the monzonite and granodiorite were likely formed in syn-collisional and syn- to post-collisional transitional settings, respectively. The East Kunlun region entered the syn-collisional stage by the Early Silurian (440 Ma), underwent rapid continental collision at 440–427 Ma, and shifted to post-collisional extension at 427–425 Ma due to slab break-off.

