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新疆西准噶尔庙尔沟岩体的地球化学及年代学研究

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## 摘要:

新疆西准噶尔庙尔沟岩体侵入于早中石炭世海相火山-沉积建造中,主体由碱长花岗岩组成,局部分布有紫苏花岗岩和碱长花岗岩脉。碱长花岗岩及岩脉高硅、富碱、贫钙,里特曼指数( $\delta$ )=2.17~2.98, A/CNK=0.96~1.03, A/NK=1.08~1.13, 为准铝质-弱过铝质高钾钙碱性花岗岩,其富集LILEs(Rb、U、K、Th),相对亏损HFSEs(Nb、Ta、P、Ti)和Ba、Sr等,以及强烈Eu负异常,过渡族地幔相容元素Cr、Ni含量低, U、Th、Pb等地壳富集元素含量较高。Sr、Nd同位素组成:  $(^{87}\text{Sr}/^{86}\text{Sr})_i=0.70370\sim 0.70541$ ,  $\epsilon_{\text{Nd}}(t)=+4.10\sim +6.79$ ,  $t_{\text{DM}}=0.57\sim 0.99$  Ga。锆石LA-ICP-MS U-Pb定年研究获得锆石U-Pb年龄为 $309\pm 1.4$  Ma,表明岩体碱长花岗岩的形成时代为晚石炭世。紫苏花岗岩的SiO<sub>2</sub>含量为60.88%~62.06%, Al<sub>2</sub>O<sub>3</sub>含量为15.50%~15.72%,里特曼指数( $\delta$ )=2.59~2.77, A/CNK=0.86~0.88, A/NK=1.50~1.53, 为准铝质钙碱性-高钾钙碱性过渡的花岗岩,相对富集LREE(Rb、U、K、Th),而亏损HREE(Nb、Ta、P、Ti)和Sr,以及较显著的Eu负异常,过渡族地幔相容元素Cr、Ni含量低, U、Th、Pb等地壳富集元素含量较高。Sr、Nd同位素组成:  $(^{87}\text{Sr}/^{86}\text{Sr})_i=0.70382\sim 0.70388$ ,  $\epsilon_{\text{Nd}}(t)=+6.67\sim +6.98$ ,  $t_{\text{DM}}=0.59\sim 0.62$  Ga。锆石LA-ICP-MS U-Pb定年研究获得锆石U-Pb年龄为 $302.1\pm 2.1$  Ma,表明岩体紫苏花岗岩的形成时代为晚石炭世。综合庙尔沟岩体的地质特征、地球化学特征、年代学和区域地质背景,认为庙尔沟岩体碱长花岗岩及岩脉为A2型花岗岩,紫苏花岗岩具有A型花岗岩的地球化学性质,且它们可能是可能来自同一个岩浆源区,属于西准噶尔后碰撞阶段的岩浆活动产物。

## 英文摘要:

The Miaoergou pluton intruded in the Early Carboniferous marine volcano-sedimentary in West Junggar, Xinjiang, the pluton is mainly composed of the alkali-feldspar granite with a little charnockites and alkali-feldspar granite dikes. The alkali-feldspar granite and alkali-feldspar granite dike are characterized by high silicon, enrichment of alkali, low calcium, Rittman index ( $\delta$ )=2.17~2.98, A/CNK=0.96~1.03, A/NK=1.08~1.13, it belongs to metaluminous-weakly peraluminous high-K calc-alkaline granite. It is relatively enriched in LILEs (Rb, U, K, Th) but poor in HFSEs (Nb, Ta, P, Ti) as well as Ba, Sr, etc. It showed a strong negative Eu anomaly, low content of such transition metal mantle compatible elements as Cr, Ni, high content of such crustal enrichment elements as U, Th, Pb. Sr-Nd isotopic compositions of the alkali-feldspar granite are  $(^{87}\text{Sr}/^{86}\text{Sr})_i=0.70370\sim 0.70541$ ,  $\epsilon_{\text{Nd}}(t)=+4.10\sim +6.79$ ,  $t_{\text{DM}}=0.57\sim 0.99$  Ga. Zircon LA-ICP-MS U-Pb dating for the granite yielded an age of  $309\pm 1.4$  Ma, indicating the formation of the alkali-feldspar granite is in Late Carboniferous. Charnockites are characterized by SiO<sub>2</sub> content changing from 60.88% to 62.06%, Al<sub>2</sub>O<sub>3</sub> content changing from 15.50% to 15.72%, Rittman index ( $\delta$ )=2.59~2.77, A/CNK=0.86~0.88, A/NK=1.50~1.53, it belongs to metaluminous calc-alkaline-high-K calc-alkaline granite. It is relatively enriched in LREE (Rb, U, K, Th), poor in HREE (Nb, Ta, P, Ti) and Sr, it showed significant negative Eu anomalies, low content of such transition metal mantle compatible elements as Cr, Ni, high content of such crustal enrichment elements as U, Th, Pb. Sr-Nd isotopic compositions of the charnockite are  $(^{87}\text{Sr}/^{86}\text{Sr})_i=0.70382\sim 0.70388$ ,  $\epsilon_{\text{Nd}}(t)=+6.67\sim +6.98$ ,  $t_{\text{DM}}=0.59\sim 0.62$  Ga. Zircon LA-ICP-MS U-Pb dating yielded an age of  $302.1\pm 2.1$  Ma, indicating the formation of charnockite is in Late Carboniferous. Compared with Miaoergou rock mass geochemical characteristics, geochronological information and regional geological setting, the author concluded that alkali-feldspar granite and alkali-feldspar granite dike are A2-type granites and charnockite showed geochemical characteristics of A-type granites. They are likely come from the same magma source, which took place during the post-collision magmatism stage in West Junggar.

关键词: [A型花岗岩](#) [锆石U-Pb年龄](#) [后碰撞](#) [庙尔沟](#) [西准噶尔](#)

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