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中南祁连西缘肃北三个洼塘地区古生代两类花岗质侵入岩年代学及其地质意义

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摘要：

中南祁连西缘三个洼塘附近花岗质岩石由花岗岩、石英闪长岩和花岗闪长岩构成。LA-ICP-MS锆石U-Pb年龄测定结果表明,花岗岩、石英闪长岩和花岗闪长岩侵位年龄分别为416.7±4.3Ma(MSWD=0.52)、442.5±4.7Ma(MSWD=0.46)和443.9±1.3Ma(MSWD=0.17),指示本区发生了两期岩浆活动事件。花岗质岩石均表现为过铝质,花岗岩高钾、K/Na,低Mg、Fe、Ca的主量元素特征,富集高场强元素,亏损大离子亲石元素,∑REE为122.0×10^{-6},δEu为0.05,具明显负铕异常。花岗闪长岩和石英闪长岩多数富钠,高场强元素含量相对花岗岩较低,而大离子亲石元素含量相对花岗岩略高,∑REE为133.3×10^{-6}~247.6×10^{-6},δEu为0.73~1.09,铕异常特征不明显。综合研究表明,本区花岗岩可能属于造山活动结束后伸展环境下地壳物质部分熔融形成的A型花岗岩,花岗闪长岩和石英闪长岩则可能属于洋壳俯冲环境下引起岛弧岩浆活动而形成的I型花岗岩,这一成果对于研究中南祁连的构造演化有着重要意义。

英文摘要：

The granitoids from Sangewatang in the western margin of Central-South Qilian are composed of granites, quartz diorites and granodiorites. LA-ICP-MS zircon U-Pb age of granite is 416.7±4.3Ma (MSWD=0.52), while that of quartz diorite and granodiotite are 442.5±4.7 (MSWD=0.46) and 443.9±1.3Ma (MSWD=0.17) respectively, indicating that two magmatic events have occurred in the study area. The granite is peraluminous with high K/Na and K content, and low Mg, Fe and Ca content. Meanwhile, it is enriched in high field strength elements, and depleted in large ion lithophile elements. Its ∑REE is 122.0×10^{-6} and δEu is 0.05 with significant Eu negative anomaly. In contrast, the granodiorite and quartz diorite are also peraluminous but are enriched in Na. They have a lower content of high field strength elements and a slightly higher content of large ion lithophile elements. Their ∑REE range from 133.3×10^{-6} to 247.6×10^{-6} and δEu range from 0.73 to 1.09, showing no significant Eu anomalies. Based on these geochemical characteristics, we conclude that the granites belong to A-type granites and were produced by partial melting of continental crust in a post-orogenic extensional setting. In contrast, the granodiorites and quartz diorites are I-type granites and are likely to be the product of island arc magmatism, associated with oceanic subduction. These results are of key importance to constrain the tectonic evolution of Central-South Qilian.

关键词：中南祁连 岩浆活动 拉张环境 岛弧 古生代

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