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准噶尔板块东南缘沙尔德兰地区A型花岗岩构造环境研究

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摘要:

研究区属于准噶尔板块东南缘,即传统意义上的北天山东段,分布有两类A型花岗岩,一种是钾长花岗岩,另一种是正长花岗斑岩。其中阔台克力克能厄肯钾长花岗岩产于大南湖岛弧带,白坡南钾长花岗岩和正长花岗斑岩均产于觉罗塔格岛弧带。白坡南与阔台克力克能厄肯钾长花岗岩同为弱过铝质,岩石化学属高钾钙碱性系列,稀土元素配分曲线为轻稀土富集型,具有明显的负Eu异常;富集大离子亲石元素,显著亏损Sr、Nb、 P_2O_5 、 TiO_2 ,具有火山弧花岗岩的地球化学特征。正长花岗斑岩从准铝质过渡到弱过铝质,岩石化学从高钾钙碱性系列过渡到钾玄岩系列,轻重稀土元素分馏不明显,具有显著的负Eu异常;富集高场强元素,亏损Ba、Sr、 P_2O_5 及 TiO_2 ,具有板内花岗岩的地球化学特征。这些钾长花岗岩和正长花岗斑岩均属于 A_2 型花岗岩。根据前人在北疆地区获取的研究成果,可将该区域岛弧环境结束与后碰撞岩石圈伸展环境开始的分界时限厘定为320Ma。根据我们的研究,白坡南钾长花岗岩体的锆石U-Pb谱和年龄为 338.3 ± 4.3 Ma,正长花岗斑岩的锆石U-Pb谱和年龄为 278 ± 2 Ma。年代学与岩石地球化学研究表明,白坡南钾长花岗岩形成于B型俯冲阶段的岛弧环境,而正长花岗斑岩形成于后碰撞岩石圈伸展环境。由此证明,A型花岗岩不仅产于非造山和后碰撞伸展环境,还可以产于岛弧环境。

英文摘要:

Two kinds of A-type granites, moyite and orthoclase granite porphyry, located at the southeastern margin of Junggar block, which is generally named north Tianshan Mountain, Xinjiang, western China. The Kotalicnircon moyite lies in the South Lake island arc belt, the Baiponan moyite and orthoclase granite-porphyry lie in the Qoltag-Red flag mountain trench-arc belt. Both Baiponan moyite and Kotalicnircon moyite belong to the high-K calc-alkaline series, they are enriched in light rare earth elements and high strength field elements, and obviously depleted in Nb and TiO_2 , and relatively depleted in Zr, Hf and P_2O_5 , which are consistent with geochemical characters of volcanic arc granites. The orthoclase granite-porphyry belongs to High-K, calc-alkaline series. They are slight fractionation between LREE and HREE, and enriched in high strength field elements, relatively depleted in Ba, Sr, P_2O_5 and TiO_2 , which are consistent with the characters of within-plate granites. According to the classification diagrams of A-type granite, both moyite and orthoclase granite porphyry belong to A_2 sub-type. Based on the reliable studies on north Xinjiang area and our research, the tectonic setting transition from island arc to lithosphere stretching settings of post-collision could be constrained to 320Ma. The zircon SHRIMP U-Pb concordant age of the Baiponan moyite, and the orthoclase granite-porphyry are 338.3 ± 4.3 Ma and 278 ± 2 Ma respectively. Therefore, geochemical characters and geochronology suggest that the Baiponan moyite should formed in island arc setting of B-type subduction, while the orthoclase granite-porphyry should formed in post-collision tectonic settings. These indicate that the A_2 -granite could form not only in non-orogenic and post-collision tectonic settings, but also in island arc settings.

关键词: [A型花岗岩](#) [地球化学](#) [年代学](#) [构造环境](#) [B型俯冲](#)

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