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宁夏泾源石咀子古元古代A型花岗岩的形成时代及其地质意义

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摘要:

对华北克拉通西缘贺兰坳拉谷南段泾源县石咀子花岗斑岩进行了岩石地球化学和年代学研究结果表明,石咀子花岗岩体具有高硅( $\text{SiO}_2=72.28\% \sim 76.69\%$ )、富钾特征, $\text{Na}_2\text{O}+\text{K}_2\text{O}$ 平均值7.61%, $\text{K}_2\text{O}/\text{Na}_2\text{O}$ 为2.17~7.39, $\text{Al}_2\text{O}_3=10.59\% \sim 11.84\%$ ,A/CNK为0.86~1.11(平均为1.01),低钙镁,岩石为高硅准铝质-弱过铝质A型花岗岩;稀土元素总量较高,为 $340.4 \times 10^{-6} \sim 468.9 \times 10^{-6}$ ,轻稀土富集,具有中等的负Eu异常,配分曲线呈典型的右倾“海鸥型”;高场强元素Ta、Nb、Ti具有明显的负异常,大离子亲石元素Rb、Ba、Th等相对富集,花岗岩具有造山后岩石地球化学特征。锆石的LA-ICP-MS U-Pb年龄为 $1803 \pm 15\text{Ma}$ ,为古元古代晚期,表明贺兰坳拉谷形成于古元古代晚期,其形成与华北克拉通古元古代晚期大陆裂解过程有关。

英文摘要:

The Shizuizi A-type granite is found in the southern part of Helan aulacogen, western margin of the North China Craton and mainly consist of K-feldspar granite porphyry. The granite is characterized by high silicon and rich potassium, including  $\text{Na}_2\text{O}+\text{K}_2\text{O}$  average 7.61%,  $\text{K}_2\text{O}/\text{Na}_2\text{O}=2.17 \sim 7.39$ ,  $\text{Al}_2\text{O}_3=10.59\% \sim 11.84\%$ , and its A/CNK=0.86~1.11 (1.01 on average), and thus is belong to subalkaline metaluminous to weakly prealuminous series, identified as A-type granite. The abundance of  $\Sigma\text{REE}$  is high, ranging from  $340.4 \times 10^{-6}$  to  $468.9 \times 10^{-6}$ . The granite show a LREE enrichment pattern and obviously intermediate negative Eu anomalies. The trace element geochemistry is characterized evidently by negative anomaly of high strength field elements Ta, Nb, Ti, etc. and positively Rb, Ba, Th, etc., and shows the characteristics of post-orogenic granite. The LA-ICP-MS zircon U-Pb age is  $1803 \pm 15\text{Ma}$ , which indicates that the Helan aulacogen is formed during Late Paleoproterozoic, and is related to the break-up of the North China Craton from the Columbia supercontinent during the end of Late Paleoproterozoic period.

关键词: [贺兰坳拉谷](#) [古元古代](#) [A型花岗岩](#) [大陆裂解](#)

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