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大别造山带研子岗碱性岩体成因及其构造意义: 锆石U-Pb年龄和地球化学制约

作者	单位
<a href="#">周红升</a>	<a href="#">信阳师范学院城市与环境科学学院,信阳 464000</a>
<a href="#">马昌前</a>	<a href="#">中国地质大学地球科学学院,武汉 430074</a>
<a href="#">陈玲</a>	<a href="#">中国地质大学地球科学学院,武汉 430074</a>

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摘要:

出露于大别造山带西南部的研子岗碱性杂岩体侵位于元古代和新太古代随县群中,本文采用锆石LA-ICPMS U-Pb定年方法,获得岩体的主体岩性角闪正长岩的岩浆锆石年龄为 $133 \pm 1$  Ma,代表岩体的结晶年龄,这一年龄也是大别造山带中已知形成时代最早的早白垩世碱性岩体的结晶年龄(单颗粒锆石U-Pb法)。研子岗碱性杂岩体具有碱性岩典型的富碱( $K_2O+Na_2O=8.38\% \sim 11.26\%$ )、低硅( $SiO_2=63.41\% \sim 66.51\%$ )的特点。主要矿物为微斜条纹长石,暗色矿物主要为镁角闪石。地球化学特征表明,全部岩石均具有高Ba-Sr花岗岩类高Ba( $1230 \times 10^{-6} \sim 4865 \times 10^{-6}$ )、高Sr( $583 \times 10^{-6} \sim 2088 \times 10^{-6}$ )和无负Eu异常( $Eu/Eu^*=0.97 \sim 1.12$ )等特征,并具有A型花岗岩的部分地球化学特征。岩石的Y/Nb比(0.46~1.09)较低,具洋岛玄武岩的部分地球化学特征, $(^{87}Sr/^{86}Sr)_i$ 初始比值(0.70513~0.70543)较低,表明岩体的物源主要来源于幔源。Nd二阶段模式年龄( $t_{DM2}=1859 \sim 1942$ Ma)和锆石Hf二阶段模式年龄( $t_{DM2}=2130 \sim 2330$ Ma)较老, $\epsilon_{Nd}(133)$ 值(-12.5~-11.4)和 $\epsilon_{Hf}(133)$ 值(-18.2~-15.4)较低。综合分析表明,岩体主要为古老的富集岩石圈地幔物质低程度部分熔融和随后地壳物质轻度AFC(混染和分离结晶作用)过程的产物,源岩熔融的热量主要来源于软流圈物质的上涌底侵作用提供。研子岗岩体形成于碰撞后构造环境,岩体的形成预示着大别造山带早白垩世造山过程的即将结束,板内时期的即将来临。

英文摘要:

This paper focuses on Yanzigang alkaline complex in the Southwest of Dabie orogenic belt, which emplaced into the Suixian Group of Proterozoic and New-Archaeon era. Using zircon LA-ICPMS U-Pb dating method, we obtained the crystallization age of the amphibole-syenite is  $133 \pm 1$  Ma, this denotes the crystallization age of this intrusive body, and this is also represents the earliest crystallization age of Early Cretaceous alkali complex. Yanzigang alkaline complex have typical characters of alkaline rocks: high alkali ( $K_2O+Na_2O=8.38\% \sim 11.26\%$ ) and low silicate ( $SiO_2=63.41\% \sim 66.51\%$ ). Main mineral compositions are microperthite and Mg-hornblende. Geochemical features indicate that the alkali rocks have high Ba-Sr granitoids features: high Ba ( $1230 \times 10^{-6} \sim 4865 \times 10^{-6}$ ), high Sr ( $583 \times 10^{-6} \sim 2088 \times 10^{-6}$ ) and no negative Eu anomalies ( $Eu/Eu^*=0.97 \sim 1.12$ ), these rocks also have partial geochemical characteristics of A-type granites. The low Y/Nb (0.46~1.09) indicates the rocks have partial geochemical characteristics of oceanic island basalt, the low  $(^{87}Sr/^{86}Sr)_i$  value (0.70513~0.70543) indicates the magma has characteristic of mantle origin. The Nd two-stage model ages range from 1859~1942Ma and Hf two-stage model ages 2130~2330Ma, and the  $\epsilon_{Nd}(133)$  value are in the extent of -12.5 to -11.4, and the  $\epsilon_{Hf}(133)$  range from -18.2 to -15.4. Compressive analysis showed that the alkali complex were the product of old enriched mantle low grade partial melting and crustal material low degree assimilation and fractional crystallization subsequently. The heat came from the upwelling of asthenosphere materials. The Yanzigang intrusive body formed in the post-collisional environment, and the emplacement of this intrusive body promised the ending orogenic process in the Dabie orogenic belt of the Early Cretaceous, and the within plate period had been coming.

关键词: [早白垩世](#) [碱性岩](#) [岩体成因](#) [锆石LA-ICPMS U-Pb年代学](#) [大别造山带](#)

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主办单位: 中国矿物岩石地球化学学会

单位地址: 北京9825信箱/北京朝阳区北土城西路19号

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