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云南“三江”变质杂岩带多期花岗质岩浆事件及其构造意义

作者	单位	E-mail
王舫	中国地质科学院地质研究所,北京 100037	wangfang_mr@163.com
刘福来	中国地质科学院地质研究所,北京 100037	
刘平华	中国地质科学院地质研究所,北京 100037	

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摘要:

云南“三江”地区地处印度板块与欧亚板块之间,记录了多期岩浆-变质热事件。本文对该区8件花岗质岩石进行了锆石年代学和地球化学研究。锆石年代学结果表明,8件样品记录了6期岩浆事件,中寒武世(501.2±5.0Ma)、晚奥陶世(456±2.1Ma)、晚二叠-早三叠世(251~246Ma)、早白垩世早期(134~125Ma)、古新世早期(55±0.62Ma)和始新世晚期(38±0.52Ma),部分样品中存在古元古代、中-新元古代的继承锆石。地球化学结果显示,这些样品SiO₂含量变化范围较大,为60.41%~77.41%,Al₂O₃含量为11.57%~17.54%,Na₂O含量为2.05%~4.16%,K₂O含量变化范围为2.09%~6.31%,早三叠世以前的花岗质岩石的A/CNK≥1,以过铝质为主;而早三叠世以后的花岗质岩石的A/CNK<1,属偏铝质。轻重稀土分异明显,Eu负异常,(La/Yb)_N值变化于5.22~19.56。其中5样品的¹⁴³Nd/¹⁴⁴Nd比值为0.51195~0.51255,ε_{Nd}(t)=0~-11.11,t_{DM}=1071~1969Ma。两件较老的样品可能反映该地区存在中寒武世和晚奥陶世的岩浆作用;晚二叠-早三叠世的岩浆事件可能是古特提斯洋闭合构造-热事件的响应;高黎贡杂岩带中早白垩世花岗质岩石可能与碰撞后地壳加厚有关;而新生代花岗质岩石则是对印支板块和欧亚板块俯冲-碰撞事件的响应。部分样品中继承锆石U-Pb年代学结果显示,最主要年龄峰值在1100~800Ma之间,指示该地区可能存在新元古代岩浆作用;少量古-中元古代锆石的存在,可能指示该地区可能存在更古老的基底物质。同样Nd模式年龄也指示该地区可能存在古元古代和中-新元古代的基底岩石。

英文摘要:

Sanjiang area is considered as the margin between Indian and Eurasian plates, recording multiple magmatic and metamorphic events. Eight granitoid rocks were collected from Diancang Shan and Gaoligong Shan complex for in situ zircon U-Pb dating and whole-rock geochemistry analysis. Based on geochronology results, six episodes of magmatism were recognized: Mid-Cambrian (501.2±5.0Ma), Late Ordovician (456±2.1Ma), Late Permian to Early Triassic (251~246Ma), Early Paleocene (55±0.62Ma) and Late Eocene (38±0.52Ma). Abundant Paleoproterozoic and Mid-Neoproterozoic inherited zircons were also indentified. Geochemistry results show that SiO₂, Al₂O₃, Na₂O and K₂O contents range from 60.41% to 77.41%, 11.57% to 17.54%, 2.05% to 4.16% and 2.09%~6.31%, respectively. Early Triassic granitoid rocks are characterized by peraluminous with A/CNK≥1, predominantly, while others are characterized by met aluminous with A/CNK<1. They show obvious fractionation of REE, negative Eu anomaly and (La/Yb)_N range from 5.22 to 19.56. Five of them have ¹⁴³Nd/¹⁴⁴Nd ratios of 0.51195 to 0.51255, ε_{Nd}(t) values of 0 to -11.11 and Nd model ages (t_{DM}) of 1071Ma to 1969Ma. The presences of two older samples suggest Mid-Cambrian and Late Ordovician magmatism. The closure of Paleo-Tethys was responsible for Late Permian to Early Triassic magmatism. The Gaoligong Early Cretaceous granitoid rocks are the magmatic expression of crustal thickening. Cenozoic granitoid rocks are related to subduction-collision between the Indian and Eurasian plates. Inherited zircon yield major age clusters at 1100~800Ma, indicating Neoproterozoic magmatic event. A few Paleo-Midproterozoic zircons imply the existence of older basement rocks. Nd model ages also support that the Paleoproterozoic and Mid-Neoproterozoic occurred in this area.

关键词: [锆石U-Pb定年](#) [地球化学](#) [花岗质岩石](#) [三江杂岩带](#)

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