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江西省早古生代晚期花岗岩的地球化学特征及其地质意义

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摘要:

上犹、陡水、龙回和乐安岩体是江西省早古生代晚期花岗岩的重要组成部分。它们具有较高的 SiO_2 含量(平均73.80%)、 $\text{K}_2\text{O}/\text{Na}_2\text{O}$ 比值(平均为1.33)和ACNK值(平均为1.05);大离子元素明显富集,Ba、Sr、P、Ti负异常明显;轻稀土元素富集(LREE/HREE比值平均为6.78),Eu亏损相对明显(δEu 值平均为0.39)。同时,它们具有稍高的 $\epsilon_{\text{Nd}}(t)$ 值(平均为-5.7)和相对年轻的Nd模式年龄(平均为1617Ma)。它们在ACF和 $(\text{La}/\text{Yb})_{\text{N}}-\delta\text{Eu}$ 图解中,投影于S型或壳源型花岗岩范围内;在 $\epsilon_{\text{Nd}}(t)-t$ 图解中,位于华南元古代地壳演化域内;在Rb/Sr-Rb/Ba和A/MF-C/MF图解中,它们的源区物质是泥质岩和砂质岩而不是幔源基性岩;此外,在研究区域内,迄今未发现早古生代幔源岩浆活动。这些特征表明,研究区内早古生代晚期花岗岩应归属于S型或壳源型花岗岩。其形成机制与早古生代晚期的板内作用有关,即早先受区域挤压应力场影响,武夷、南岭、赣中等块体彼此拼贴,进而增生到扬子地块之上;稍后,由于应力场的转化,进入后碰撞伸展环境。并在减压、导水等因素的综合影响下,位于中、上地壳层位的低成熟度泥砂质碎屑岩发生部分熔融,形成S型或壳源型花岗岩。

英文摘要:

Granitic plutons, Shangyou, Doushui, Longhui and Luean, as important members of granites formed at late stage of Early Paleozoic in Jiangxi Province, are characterized by higher SiO_2 content (an average of 73.80%), $\text{K}_2\text{O}/\text{Na}_2\text{O}$ ratio (an average of 1.33) and ACNK value (an average of 1.05). They possess distinct enrichment in large ion elements, negative anomaly in Ba, Sr, P and Ti, enrichment in LREEs (an average LREE/HREE of 6.78) and depletion in Eu (an average δEu of 0.39). Isotopically, they have relatively high $\epsilon_{\text{Nd}}(t)$ value (an average of -5.7) and young Nd model age (an average of 1617Ma). In the ACF and $(\text{La}/\text{Yb})_{\text{N}}-\delta\text{Eu}$ diagrams, they are plotted in the field of S-type or crustal derived type granite. In the $\epsilon_{\text{Nd}}(t)-t$ diagram, they are located in the Proterozoic crustal evolution domain in South China. In the Rb/Sr-Rb/Ba and A/MF-C/MF diagrams, they are plotted in the partial melting source field of protolith of argillite and psammite, but not in that of mantle-derived mafic rocks. In addition, Early Paleozoic mantle-derived magmatic rocks have not been found in the studied area. These characteristics indicate that granites formed at late stage of Early Paleozoic in the studied area are belonged to the S-type or crustal derived type granites. Geogenesis of the granitoids is thought being related to the intra-plate tectonism during the late stage of Early Paleozoic. Under the regional compression stress field in the early stage, Wuyi, Nanling and Central Jiangxi blocks collision each other and then accreted onto the southeastern Yangtze block. Later on, the studied area changed into post-collisional extension environment due to a transform of regional stress field, leading to partial melting of the low mature muddy-sandy rocks under influence of pressure reduction and water infiltration in the middle-upper crust, and formation of S-type or crustal derived type granites.

关键词: [元素和同位素地球化学](#) [早古生代晚期花岗岩](#) [陆内造山](#) [S型或壳源型花岗岩](#) [江西省](#)

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