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安徽铜陵中生代侵入岩地质地球化学特征再认识及成因讨论

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摘要:

安徽铜陵地区是我国最著名的铜多金属矿产地,岩浆岩出露广泛,岩浆作用与成矿关系密切。作者广泛收集了前人对铜陵地区中生代岩浆岩的研究资料和成果,并在此基础上进行了仔细的岩相学观察和深入的岩石学、岩石化学和微量元素及同位素地球化学研究,系统总结了该区中生代侵入岩的地质地球化学特征,并探讨了其成因机制。研究认为:①铜陵地区中酸性侵入岩形成于晚侏罗世-早白垩世(135~147Ma),岩浆活动持续时间大约为10~15Ma;岩体沿近东西向深断裂呈带状分布,浅成侵入产出,受多期不同方向和性质的断裂控制。②依据Q-A-P图解确定区内侵入岩主要为辉石闪长岩、石英(二长)闪长岩和花岗闪长岩3类中酸性闪长质岩石,均属亚碱性高钾钙碱性系列。③3类侵入岩具有相似的微量元素、稀土元素和Pb-Sr-Nd-O同位素地球化学特征,反映原始岩浆起源于富集岩石圈地幔,受到壳源物质的混染。④3类侵入岩可能是地壳深部带状岩浆房不同岩浆层中的岩浆与构造运动诱发的深断裂相沟通并随机地上升、脉动式侵位形成的;深部岩浆房中的带状岩浆层可能是由于温度梯度引起扩散对流作用进而发生一定程度的熔离分异作用所致;岩浆演化过程中存在镁铁矿物及磷灰石和锆石等矿物的结晶分异作用。⑤铜陵地区中生代岩浆活动的大地构造背景是大陆板块内部,岩浆作用与晚侏罗纪古太平洋板块的俯冲作用密切相关,但同时受区域前中生代基底构造的制约;侵入岩原始岩浆起源于挤压向拉张转换的动力学背景下的岩石圈地幔加厚之后的减压熔融并底侵下地壳岩石。

英文摘要:

Tongling area in Anhui Province is one of the most famous copper polymetallic deposits producers where magmatic rocks developed widely and the magmatism had a close relationship with the mineralization. Based on widespread collection for the previous research data and deep comprehension on the predecessors' achievements, and careful observation of petrography and systematic investigation of petrology, petrochemistry, trace element as well as isotope geochemistry, the geological and geochemical characteristics of the Mesozoic magmatic rocks in the Tongling area have been summarized, and the petrogenesis discussed. The results are as follows: (1) The ore-related magmatic rocks in Tongling formed in the Late Jurassic to Early Cretaceous (135~147Ma), and the duration of magmatic activities was approximately 10 to 15Ma; The intrusive rocks show zonal distribution along with east-west deep faults and hypabyssal intrusive output, mainly controlled by multistage faults in different directions and properties. (2) According to Q-A-P diagram, the intrusive rocks can be divided into pyroxene diorite, quartz diorite and granodiorite, and all of the three kinds of intermediate-acid dioritic rocks are belong to high potassic calc-alkaline series. (3) The similar geochemical characteristics of trace elements, rare earth elements and Pb-Sr-Nd-O isotope for the three kinds of intrusive rocks indicate that the magma was originated from an enriched lithospheric mantle and assimilated by the crustal materials. (4) The magma was likely derived from different layers of the magma chamber which were zonally distributed in the lower crust and randomly ascended, intruded in pulse, connecting with deep faults induced by tectonic movements; The zonal magma layers in the deep magma chamber maybe caused by a certain degree of liquidational differentiation due to the convection and diffusion which was caused by temperature gradient; Fractional crystallization of mafic minerals, zircon and apatite may exist in the process of the magmatic evolution. (5) The geotectonic background of the Mesozoic regional magmatic activities of Tongling area maybe inside of the continental plate. The magmatism was closely relevant to subduction of the Paleo-Pacific plate, also restricted by pre-Mesozoic basement. The primary magma of the intermediate-acid intrusive rocks in this area is inferred to be a mixing of mantle-derived basaltic magma and lower crust-derived adakite-like magma which formed by underplating of the mantle-derived magma.

关键词: [闪长质侵入岩](#) [地质地球化学特征](#) [岩浆起源和演化](#) [成岩动力学过程](#) [安徽铜陵](#)

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