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华北克拉通中生代破坏前的岩石圈地幔与下地壳

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摘要:

华北克拉通是世界上最古老的克拉通之一,有 38 亿年的古老陆壳存在,它经历了复杂的地质变迁,在太古宙末(约2500Ma)基本完成克拉通化,在古元古代(约1900~1850Ma)整体受到了高级变质作用,最终完成了克拉通化。它的东部在中生代发生了重大的构造机制的转变,克拉通基底发生了破坏、置换和再造。在太行山重力梯度带以西的华北克拉通受中生代构造转折的改造程度较低,它们的下地壳和岩石圈地幔结构,大致保持了华北克拉通破坏前的状态。前寒武纪麻粒岩地体代表了掀翻抬升到地表的古元古代下地壳,出露地表的时间大致在1850~1800Ma。中、新生代火山岩中的地幔和麻粒岩捕虏体代表了现代的岩石圈地幔和下地壳的岩石。岩石学、地球化学和地球物理的研究,推测华北克拉通西部的岩石圈厚约200km,地壳厚度约45km~50km,是在古元古代(约1.9Ga)时期终极克拉通化作用形成的,其厚度和结构与全球典型的元古宙克拉通岩石圈相同。而太行山重力梯度带以东的克拉通岩石圈地幔受到程度不等的交代、改造、置换和减薄,下地壳大规模重熔,地壳厚度也发生减薄,指示了强烈的壳幔解耦、物质交换和重新耦合的过程。

英文摘要:

The North China Craton (NCC) is one of the oldest cratons in the world, which has complicated tectonic history with 3.8Ga continental rocks. The NCC fundamentally formed at the end of Archean, and underwent high-grade metamorphism and ultimately completed cratonization at Paleoproterozoic of 1.9~1.85Ga. A Mesozoic tectonic inversion occurred in eastern North China with a large-scale lithospheric thinning beneath the sub-continent. Disruption of the western part of the NCC was not critical, therefore its present lithosphere may roughly indicates the state of the lithosphere before Mesozoic thinning. The granulite terrain represents the Paleoproterozoic lower crust, and the xenoliths of granulites from Mesozoic-Cenozoic basalts represent the present lower crust. The thickness of the lithosphere beneath the western NCC is about 200km based on the petrological, geochemical and seismological data, the crust is about 45km~50km in Paleoproterozoic period (~1.9Ga), which is consistent with those of other cratons in the world. Moreover, the lower crust and lithospheric mantle in the eastern North China Craton (NCC) was thinned in the Mesozoic, with large-scale partial melting of lower crust and magmatic underplating, indicating an intensive decoupling of mantle-crust, leading to lithospheric disruption and re-construction of the craton.

关键词: [华北克拉通](#) [中生代](#) [破坏前的岩石圈状态](#)

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