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拉萨地体东南部变质岩的成因与中-新生代造山作用

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摘要:

本文对青藏高原拉萨地体东南部林芝地区分布的变质岩进行了岩石学和年代学研究,结果表明这套岩石在中-新生代经历三期变质作用,形成了三个变质带,它们是:(1)米林变质带,经历了高温中压麻粒岩相峰期变质作用和角闪岩相退变质作用,峰期麻粒岩相的变质作用温、压条件为830~900℃和0.9~1.3GPa,变质时代为90~80Ma的晚白垩世;(2)八一变质带,经历了低压角闪岩相变质作用,变质作用温、压条件为625~679℃,0.4~0.55GPa,变质作用时间为55~50Ma的始新世;(3)布久变质带,经历中压角闪岩相变质作用,变质作用温、压条件为615~663℃和0.5~0.8GPa,变质作用时间为32~26Ma的渐新世。研究表明,拉萨地体东南部的中高级变质岩系的原岩主要由形成在晚古生代的沉积岩和古生代-新生代的岩浆岩组成,变质沉积岩的物质源区具有格林威尔和泛非造山作用的构造热事件记录,表明拉萨地体具有冈瓦纳大陆的构造亲缘性。我们认为,拉萨地体东南部的晚白垩世高温中压变质作用发生在新特提斯大洋岩石圈向拉萨地体之下俯冲所导致的安第斯型造山作用过程中,始新世的低压角闪岩相变质作用发生在印度与欧亚碰撞和深俯冲的新特提斯洋壳断离过程中,而渐新世的中压角闪岩相变质作用发生在印度大陆向欧亚大陆之下的持续俯冲,地壳加厚过程中。因此,拉萨地体东南部的高级变质岩揭示了俯冲/碰撞复合造山带上盘、下地壳的组成与构造演化历史。

英文摘要:

This work researched the petrology and chronology of the metamorphic rocks distributed in the Nyingchi region from the southeastern segment of Lhasa terrane, Qinghai-Tibet Plateau. Our study indicates this suit of metamorphic rocks experienced three-stage metamorphism during Mesozoic-Cenozoic, and formed three metamorphic belts. Firstly, Mainling belt experienced peak high temperature (HT) and medium pressure (MP) granulite-facies metamorphism, the amphibolite-facies retrograde metamorphism. The temperature and pressure conditions of the peak granulite-facies metamorphism are 830~900℃ and 0.9~1.3GPa. And the time of metamorphism is the Late Cretaceous of 89~81Ma. Secondly, Bayi belt generally experienced low pressure (LP) amphibolite-facies metamorphism, of which the time is Eocene of 55~49Ma. And the temperature and pressure conditions are 625~679℃ and 0.4~0.55GPa. Thirdly, Bujiu belt experienced MP amphibolite-facies metamorphism, of which the time is Oligocene of 36~26Ma. And the temperature and pressure conditions are 615~663℃ and 0.5~0.8GPa. This study demonstrates that the protoliths of these metamorphic rocks is mainly composed of the Late Paleozoic sedimentary rocks and the Paleozoic to Cenozoic magmatic rocks. Moreover, the material sources of the metasedimentary rocks have the records of the tectono-thermal events related to the Grenville and Pan-African orogenesis, indicating a tectonic affinity to Gondwana supercontinent. We consider that the Late Cretaceous HT and MP metamorphism related to the Andean-type orogeny derived from the subduction of Neo-Tethyan oceanic lithosphere, the Eocene LP amphibolite-facies metamorphism formed during the collision orogeny between Indian and Eurasian continents and then the deep-subduction slab's break-off of Neo-Tethyan, and the Oligocene MP amphibolite-facies metamorphism resulted from the crustal thickening caused by the subduction between India and Eurasia continents. Therefore, the high-grade metamorphic rocks located on the southeastern segment of Lhasa terrane not only reveals the middle and lower crust composition, but also the tectonic evolution for the hanging wall of the subduction/collision compound orogenic belt.

关键词: [拉萨地体](#) [高级变质岩](#) [多期变质作用](#) [中-新生代](#) [复合造山作用](#)

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