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新疆阿克苏地区前寒武纪蓝片岩构造—热演化史

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摘要:

阿克苏前寒武纪蓝片岩产于塔里木盆地西北缘的柯坪隆起区内。近二十年来, 中外科学家对其展开了深入研究, 并获得了许多新的同位素年龄资料, 但是年龄测定大多偏重于确定蓝片岩的变质年龄, 蓝片岩形成后的构造演化方面的研究尚显不足。为了讨论: 1. 裂变径迹数据有没有记录到阿克苏蓝片岩形成后快速折返至地表的信息? 2. 阿克苏蓝片岩剥露以后是否经历过再次埋藏和剥露, 再次埋藏的深度和剥露的时间? 3. 蓝片岩的构造热演化过程对大陆边缘不同构造事件的响应; 采集阿克苏地区前寒武纪蓝片岩带样品进行磷灰石裂变径迹测试, 6个样品的年龄值介于107.5~62.5Ma之间, 远小于高压变质年龄, 径迹长度介于10.46~12.12 $\mu\text{m}$ 。结合前人研究成果、本区地层序列和裂变径迹热史模拟结果, 大致重建了蓝片岩的热史演化: 1. 蓝片岩形成(872~862Ma)后快速折返至地表, 可能在整个早震旦世一直遭受剥蚀, 到晚震旦世才重新开始接受沉积埋藏; 2. 晚震旦世地层基本保持连续, 整个古生代也仅缺失中、上志留统, 中、下石炭统。至古生代末, 早震旦世和整个古生代地层厚度已近万米。蓝片岩完全退火, 年龄被重置; 3. 中生代晚期区内地层普遍开始隆升, 裂变径迹时钟重新开始计时; 4. 古新世开始有沉积作用发生, 样品接受埋藏增温至部分退火带, 随后可能由于印度-欧亚板块碰撞的远程效应, 中新世地层重新开始隆升剥露。

英文摘要:

Aksu Precambrian blueschist is located in Kepin uplift of northwestern margin of Tarim basin. In last twenty years, foreign and Chinese geologists have done lots of researches and got lots of new data on isotopic age. However, studies on dating are mostly aimed at determining the metamorphic age, while researches on thermo-tectonic evolution of blueschists are rare. This paper is devoted to discussing the following questions: 1. Whether the quick process of Aksu blueschists' rebound to earth surface has been recorded by fission track? 2. Whether Aksu blueschist has experienced reburial and re-exhumation after its exhumation? If it has, at what depth and when did it happen? 3. How has the thermo-tectonic evolution of Aksu blueschist responded to the different tectonic events that have occurred at Tarim continental margins; of blueschist samples collected in Aksu for apatite fission track dating, six are between 107.5~62.5Ma, far less than blueschist face metamorphic age, and confined fission track lengths are between 10.46~12.12 $\mu\text{m}$ . According to previous researches, regional stratigraphic sequence and results of fission track thermal history modeling, we have basically reconstructed the thermo-tectonic evolution of Aksu blueschist: 1. Aksu blueschist rebounded to surface soon after its formation, and it probably had been under erosion during early Sinian, where there were no sedimentation until later Sinian; 2. Late Sinian strata were continuous. In the whole Paleozoic strata, only mid and upper Silurian, lower and mid carboniferous series were absent. The total thickness of early Sinian and Paleozoic strata were ca. ten thousand meters. Annealing was thorough, so fission track ages were reset; 3. Regional strata largely began to uplift during later Mesozoic, and fission track clock restarted; 4. Deposition began again in Paleocene, Aksu blueschist was heated to partial annealing zone. In Miocene Aksu blueschist was involved in re-exhumation once more, which was assumed to be in response to the result of far-field effects from India-Eurasia collision.

关键词: [阿克苏](#) [蓝片岩](#) [裂变径迹](#) [构造—热演化](#)

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