

论文

中天山东段中元古代晚期—古生代构造 热事件:SHRIMP锆石年代学证据

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摘要:

星星峡杂岩是中天山构造带东段出露的最老岩石,主要岩性为斜长角闪岩和各种副变质岩,并被中—新元古代花岗片麻岩和古生代片麻岩所侵位。文中利用SHRIMP定年方法,对星星峡杂岩的一个片岩和侵入其中的一个花岗片麻岩样品进行了锆石U-Pb测年。其中片岩样品中的碎屑锆石给出1 800、1 530和1 200 Ma 3组大约年龄,表明其源区不仅包括古元古代和中元古代早期还含有中元古代晚期的地壳物质。在这些碎屑锆石中,最年轻的年龄为(1 189±65) Ma,与该区中元古代大约1 200 Ma岛弧岩浆活动相近,可代表其沉积时的最大年龄。同时获得约910和470 Ma的两组较年轻年龄;前者解释为变质年龄,后者为岩浆扰动年龄,与花岗质片麻岩样品的侵位时代相一致。中天山构造带东段的中元古代晚期岩浆(大约1 200 Ma)和变质作用(大约910 Ma)的发生时间与华南、南极洲东部、澳大利亚南部和北美西南部所报道的格林维尔期增生 造山事件在时间上接近,表明中天山构造带东段与Rodinia超大陆的汇聚过程密切相关。

关键词: SHRIMP; 构造-热事件; 构造演化; Rodinia; 中天山构造带东段

Late Mesoproterozoic to Paleozoic tectonothermal events in the Eastern Segment of the Central Tianshan Tectonic Zone of Northwestern China: Constraints from SHRIMP zircon geochronology.

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Abstract:

The Proterozoic Xingxingxia Complex is the oldest exposed unit in the Eastern Segment of the Central Tianshan Tectonic Zone (ESCTTZ), which consists mainly of amphibolites and various parametamorphic rocks, and was intruded by Meso- Neoproterozoic and Palaeozoic granitoid gneisses. The SHRIMP U-Pb dating of detrital zircon from a schist sample of the Xingxingxia Complex in the ESCTTZ yielded three distinct ages of ~1 800 Ma, 1 530 Ma and 1 200 Ma, suggesting that the sediments derived not only from Palaeoproterozoic and Early Mesoproterozoic precursors but also from Late Mesoproterozoic precursors. The minimum detrital zircon age of (1 189±65) Ma, which is consistent with the ca. 1 2 Ga island arc magmatic activity, could provide a significant constraint on the maximum depositional age for these sediments. In addition, the zircons from the schist sample also give two ages of about 910 and 470 Ma, respectively. The former is interpreted as the age of metamorphism; the latter, which is identical, within error, to the emplacement age of the identified Palaeozoic granitoid gneiss sample, is attributed to the disturbance of the Palaeozoic tectono-thermal event. The ages of magmatic (ca. 1 200 Ma) and metamorphic (ca. 910 Ma) events in the ESCTTZ are akin to the ages of geologic events reported elsewhere in South China, East Antarctica, South Australia and southwestern North America, which signifies that the ESCTTZ may have played a crucial role in the assembly of the supercontinent Rodinia.

Keywords:

SHRIMP data; tectonothermal events; tectonic evolution; Rodinia; ESCTTZ

收稿日期 2008-11-20 修回日期 2008-12-24 网络版发布日期 null

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基金项目:

国家自然科学基金项目(40072065);中石化前瞻性项目“塔里木盆地及其邻区动力学演化和油气远景研究”

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