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准噶尔盆地周边硅质岩激光 $^{40}\text{Ar}/^{39}\text{Ar}$ 法定年

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摘要:

由于较低的钾元素含量以及过剩氩的存在, 长期以来对硅质岩的 $^{40}\text{Ar}/^{39}\text{Ar}$ 定年一直存在较大难度. 近年来, 由于仪器水平的不断提高, 实验技术和方法的应用, 特别是激光全熔 $^{40}\text{Ar}/^{39}\text{Ar}$ 定年技术的应用, $^{40}\text{Ar}/^{39}\text{Ar}$ 定年方法具有了足够高的测试精度和稳定的低本底水平, 可以满足测试极低钾元素含量的硅质岩样品的要求. 利用多组矿物颗粒测试数据计算等时线年龄的方法可以很好地去除过剩氩对硅质岩年龄的影响. 本文利用激光全熔 $^{40}\text{Ar}/^{39}\text{Ar}$ 定年方法对新疆准噶尔盆地边缘的两个硅质岩样品进行了定年研究. 采自白碱滩地区的08BJT-3样品的年龄测试结果为 $294 \pm 14\text{Ma}$, 该年龄结果与硅质岩样品所处的晚石炭世地层沉积年代基本一致. 采自卡拉麦里地区的KML-2样品的年龄测试结果为 $266 \pm 14\text{Ma}$, 该年龄结果与强烈变形改造硅质岩样品的卡拉麦里构造变形带活动年代十分一致, 表明激光全熔 $^{40}\text{Ar}/^{39}\text{Ar}$ 定年方法可以准确地对硅质岩进行定年.

英文摘要:

In the past, it was difficult to get the accurate $^{40}\text{Ar}/^{39}\text{Ar}$ dating results of siliceous rocks with low potassium and high excess ^{40}Ar content. In recent years, due to the improvement of instruments and the application of new techniques and methods, in particular, the application of laser $^{40}\text{Ar}/^{39}\text{Ar}$ dating method, $^{40}\text{Ar}/^{39}\text{Ar}$ dating method has both high enough precision and low enough background level to meet the requirements of getting precise age for siliceous rocks with low potassium. The method using data of multiple sets of mineral particles to calculate isochrone age can be adopted to eliminate the impact of excess ^{40}Ar on the age of siliceous rocks. This paper use laser $^{40}\text{Ar}/^{39}\text{Ar}$ dating method to date two siliceous rocks collected from the edge of the Junggar Basin in north Xinjiang. The age of the sample 08BJT-3 collected from Baijiantan area is $294 \pm 14\text{Ma}$. It is basically consistent with the depositional age of the Late Carboniferous strata which the siliceous rock sample lies in. The age of the sample KML-2 collected from Karamaili area is $266 \pm 14\text{Ma}$. It is fully consistent with the activity age of the Karamaili fault zone which strongly transforms the siliceous rock sample. Both of these indicate that the laser $^{40}\text{Ar}/^{39}\text{Ar}$ dating method can accurately date the siliceous rocks.

关键词: [激光 \$^{40}\text{Ar}/^{39}\text{Ar}\$ 定年](#) [硅质岩](#) [准噶尔盆地](#)

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