

A New Muscovite ^{40}Ar - ^{39}Ar Age and its Implications for the Ziyuan-Xinnin Ductile Shear Zone of Northeastern Guangxi, China

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Ziyuan-Xinnin ductile shear zone occurs along the western margin of the Yuechengling batholith in NE Guangxi of south China. The shear zone is a large, sinistral-normal strike-slip zone. 100 km long and 2-10 km wide with a strike on NEN, the zone consists of mylonite, tectonic gneiss, and tectonic schist. Field investigation suggests that it is a long-lived, episodic fault zone. In this study, we collected muscovite samples from the tectonic muscovite schist from Xiangxi rock quarry located in the south section of the shear zone. The samples were irradiated at the U.S. Geological Survey TRIGA Reactor in Denver and dated at the Noble Gas Laboratory of University of Arizona by using ^{40}Ar - ^{39}Ar step-heating method. The dating yielded a 143 ± 3 Ma plateau age. Field observations indicate that the tectonic muscovite schist zone where the samples were collected, strikes in NWN and is superimposed in the main mylonite zone. The obtained muscovite age is interpreted as an age for the tectonic muscovite schist zone. The age of the main shear zone should be older (an Ar-Ar work is on the way to find its age). The results confirm that the ductile shear zone is an episodic fault zone with a younger tectono-thermal activity at 143 ± 3 Ma. The episodic tectono-thermal activities in the NE Guangxi region since the Caledonian orogeny are also recorded in and supported by several large-scale, similar shear zones in vicinity. For example, the Bendong granitic mylonite is aged at 404.3 ± 6.2 Ma, the Motianling granitic mylonitic-gneiss at 425.7 ± 0.9 Ma, and the Yuanbaoshan granitic mylonitic-gneiss at 324.8 ± 0.58 Ma^[1].

Acknowledgement: This research was financial supported by NSFC (No. 41162005), Guangxi NSF (No. 2012GXNSFCA053007) and a Bagui Scholar Innovation Project of Guangxi Province (to Xu).

[1] Zhang, Guilin. (2004) Changsha: Central South University dissertation, 114-137