

Geological characterization of reactivated NE-SW trending basement faults in the northwestern Hiroshima City

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Many left-lateral faults along NE-SW trending lineaments that are clearly recognizable on the topographic map or satellite image are well known in the western Hiroshima Prefecture. Some of them are reactivated as right-lateral active fault in the northwestern Hiroshima City. The aim of this study is geological characterization of reactivated faults, i.e. how different they are from other faults. K-Ar ages of clay veinlet injected into fault gauges show that those faults were formed at least in the end of Cretaceous (Kitagawa et al., 1996). As the displacement of pre-Cretaceous accretionary complex along these faults is larger than that of late Cretaceous granitic rocks, the fault movement might have been initiated from as far back as early Cretaceous. Nureki (1969) stated that some of these faults experienced 20-60 km left-lateral displacement by the reconstruction of E-W trending zonation of pre-Cretaceous terranes. However, there are some obvious mistake in his terrane classification (Hayasaka, 1987). As any microfossils have not been described from the pre-Cretaceous formations in this area due to strong contact metamorphism by the Cretaceous granites, detailed re-examination has not been made until now. In order to approach this problem, we conducted the detrital zircon U-Pb chronology and geochemical characterization of greenstone. The results are as follows.

Many lenses of greenstone with amphibolite are cropped out on the Ota-River basin at the southeast of Imuro. Their whole rock chemistry is similar to High- μ type basalt in the Tamba Terrane.

All samples collected from Ota-River basin can be correlated with Tamba Terrane by their detrital zircon ages. Further, the basement complex distributed between Kabe and Imuro can be correlated to the Type II Unit of Tamba Terrane, while that of the Fukawa area on the east of Kabe and Kuchi area on the west of Imuro to the Type I Unit.

The age population of detrital zircon from roof pendant distributed at Mt. Bizenbou in the north of Kabe shows its belonging to the Maizuru Terrane, though it had been thought to belong to the Tamba Terrane until now.

Recently, Saito et al. (2015) reported that crystalline schist origin hornfels derived from Suo Terrane is distributed in the Mt. Abu area to the south of Kabe. But the most of the rocks are moderately deformed pebbly mudstone and its detrital zircon shows the age population identical to that of Tamba Terrane.

Conclusion

Northeastern extensions of all three active faults in this area; Itsukaichi fault, Koi fault and Hiroshima western margin fault coincide with the basement faults as the high-angle terrane boundary or unit boundary of pre-Cretaceous basement complex. Thus, we conclude that, among so many NE-SW trending basement faults, only those having relatively larger amount of displacement were reactivated as active faults.

Keywords: active fault, western Hiroshima Prefecture, seismic basement, detrital zircon, U-Pb dating, Tamba Terrane