



LA-ICP-MS Zircon U-Pb Dating and its Geological Significance of Granodiorite Porphyry from the Southern Section of the Garzê-Litang Suture Zone

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Abstracts: Many granodiorite porphyries with copper-molybdenum mineralization, as an important part of Yidun island arc complex orogenic belt, have been explored in the southern part of the Garzê-Litang suture zone in recent years. In this paper, the emplacement age of Boniangou quartz-monzonite porphyry is extracted by using LA-ICP-MS zircon U-Pb chronology method, which is used to compare with other granodiorite porphyry in the region. Most zircon grains are euhedral, and transparent to light brown, with clear igneous oscillatory or planar growth zonation in their CL images. The Th contents of zircon are 135–1055ppm while U contents are 216–1377ppm, and the Th/U ratio are 0.37–0.94, all of which prove that the zircons belong to magmatic zircons. Analyses of 20 zircon grains from sample yielded $^{206}\text{Pb}/^{238}\text{U}$ age of 211 to 225 Ma, and is projected on the U-Pb harmonic map in the vicinity of the harmonic line with weighted mean $^{206}\text{Pb}/^{238}\text{U}$ age of 217 ± 1.8 Ma (1σ , MSWD=1.17, Fig. 1). Combined with the previous research results, it can be known that quartz-monzonite porphyry from Boniangou was formed in the process of the western subduction of Garzê-Litang ocean.

Regionally, a large number of diagenetic age of previous studies on the porphyry bodies of the ore deposits in the area, e.g. the porphyry age range of the Xuejiping deposit is 213–215

Ma, and the porphyry age range of the Pulang mining area is 215–219 Ma, while Boniangou and Degongniuchang are of 217 and 216 Ma respectively. The above age data indicates that the porphyry bodies in the Xuejiping and Pulang mining areas are the same as the porphyry bodies in the Boniangou mining area, which are the products of the magmatic action during the westward subduction of the Garzê-Litang oceanic crust. On the other hand, the age of porphyry diagenesis has a tendency to gradually decrease from east to west, which is consistent with the direction and angle of the Garzê-Litang ocean subduction. At the same time, the metallogenic porphyry in the southern part of the Yitun island arc shows a trend of eastward extension. The discovery of the Boniangou and Degongniuchang ore-bearing porphyry provide a new vision for finding porphyry polymetallic deposits in the Garzê-Litang suture zone.

Key words: Garzê-Litang suture zone, Boniangou, LA-ICP-MS zircon U-Pb chronology, Metallogenesis

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References

- Deng, J., Wang, Q.F., Li, G.J., Li, C.S., Wang, C.M., 2014. Tethys tectonic evolution and its bearing on the distribution of important mineral deposits in the Sanjiang region, SW China. *Gondwana Research*, 26(2): 419–437.
- Hou, Z.Q., Yang, Y.Q., Qu, X.M., Huang, D.H., Lu, Q.T., Wang, H.P., Yu, J.J., Tang, S.H., 2004. Tectonic evolution and mineralization systems of the Yidun arc orogen in Sanjiang region, China. *Acta Geologica Sinica*, 78(01): 109–120 (in Chinese with English abstract).
- Liu, X.L., Li, W.C., Zhang, N., Yin, G.H., Deng, M.G., 2014. Geochronological, geochemical characteristics of Disuga ore-forming I-type granitic porphyries in the Geza Arc, Yunnan Province, and their geological significance. *Geological Review*, 60(01): 103–114 (in Chinese with English abstract).
- Mo, X.X., Deng, J.F., Dong, F.L., Yu, F.L., Wang, Y., Zhou, S., Yang, W.G., 2001. Volcanic petrotectonic assemblages in Sanjiang orogenic belt, SW China and implication for tectonics. *Geological Journal of China Universities*, 7(02): 121–138 (in Chinese with English abstract).
- Zeng, P.S., Mo, X.X., Yu, X.H., Hou, Z.Q., Xu, Q.D., Wang, H.P., Li, H., Yang, C.Z., 2003. Porphyries and porphyry copper deposits in Zhongdian area, Northwestern Yunnan. *Mineral Deposits*, 22(04): 393–400 (in Chinese with English abstract).

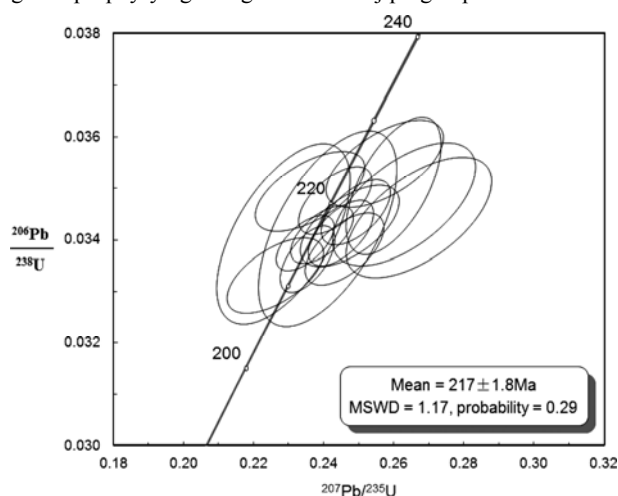


Fig. 1. LA-ICP-MS zircon U-Pb concordia diagrams for the Boniangou Granodiorite Porphyry.

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