The distribution of adakite-like rocks in South Anhui province, China

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Recent years many geologists discovered adakite-like rocks in South Anhui of China during Yanshaian [1], which area provides many copper and iron ores along middle-lower Yangtze River. To decide the distributed range of adakite-like rocks, the authors sampled igneous rocks in Yanshanian from the North Huaiyang, North Dabie and Yangzi craton (Fig.1). Based on the special geochemical characters of adakite-like rocks, by using the contents of SiO2 and Al2O3 and the isograms of Sr/Y [2], we got the range of adakite-like rocks in South Anhui. They are the 'A' area from Tongcheng to Anqing and the 'B' area including Tongling and occupy a quarter of South Anhui (Fig. 1).

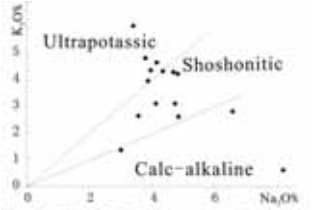

Fig. 2 The Na_2O–K_2O gram of samples in adakite area in South Anhui, China

Fig. 2 indicates that the rocks in the adakite area in South Anhui (Fig. 1) are shoshonitic and ultrapotassic and belong to C-type adakite-like rocks [1] which are derived from intraplate magmatism. It provides evidence that in Yanshanian the basalt magma from asthenosphere had intruded into the thicker lower crust in East China and led to partial melting of granulites in the lower crust [3]. In the range of adakite-like rocks in South Anhui there are copper ores near Anqing and Tongling area, so it is concluded the copper ore-forming had a close connection with mantle rising and basalt intrusion and some copper ores may be discovered near Tongcheng in the future.

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Recycling of lower continental crust in the Trans-North China Orogen: Evidence from zircon dating of mantle composite xenoliths

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Crust-mantle interactions can take place in two ways: (1) underplating of mantle-derived magma at the base of the lower crust [1, 2], and (2) melting of recycled crustal rock (via delamination or subduction) in the upper mantle, inducing silicate melt-peridotite interaction and eclogite + peridotite mixing [3-6]. The former could have played an important role in the growth of the continental crust [1], while the latter is thought to be partially responsible for generating mantle heterogeneity [7]. Abundant lower crustal and mantle xenoliths in the Neogene Hannuoba basalt along the northern margin of the North China Craton provide a rare opportunity to study the above two types of crust-mantle interactions.

We present the first finding of continental crust-derived Precambrian zircons in garnet pyroxenite veins/layers within mantle xenoliths formed by melt-lherzolite interaction. The Precambrian zircon ages can be classified into three groups of 2.4 - 2.5 Ga, 1.8 - 2.0 Ga and 0.7 - 1.5 Ga, coinciding with the major geologic events in the North China Craton. Zircons from the garnet pyroxenites generally fall in the field of continental granitoid rocks in the plots of U/Yb versus Hf and Y. Trace element compositions of the zircons do not support an oceanic crustal component in the mantle, but instead indicate continental crustal material. These continental crust-derived Precambrian zircons in the mantle xenoliths provide robust evidence for the recycling of lower continental crust into the mantle in the central zone of the North China Craton.

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