Nb/Ta in Lajimiao gabbro: Implications for lower crust melting

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The Lajimiao gabbro is located to the north of the Shang-Dan fault, which is suggested to be the main suture of the Qinling Mountains, central China. Which consists mainly of gabbro (>80%) and norite-gabbro.

The formation and textonic affinity of the Lajimiao gabbro is very important for understanding the formation and evolution of the Qinling orogenic belt.

Published results suggested that it is a part of Danfeng ophiolite [1-2], and indicate large amount of sediments were carried into the mantle [3], which led to the OIB models for the early history of North Qinling orogenic belt. In fact, whether the Lajimiao gabbro are ophiolite should be reevaluated, for the norite-gabbro with higher Zr and Ti, and lower K, Rb and Ba [3].

In this study, we give the geological characteristics of the gabbro, show LREE are riched, and Nb/Ta ratios from 2 to 12, are lower than the bulk silicate (~14) and the contimental crust (~12-13). These are different with OIB source characteristics, further more, Na/Ta versus Zr/Hf were correlative, these phenomena is probably relative with partial melting. So we confer that the Lajimiao gabbro was results from lower crust melting during the plate subductions along the Shang-dan fault.

The north Qinling orogenic belt is believed to be the result of collisions of the North and South China blocks [4]. We propose that the Lajimiao gabbro was formed of lower crust melting during the subducting of the South China block northward. These results provide more constraints on the evolution of the Qinling orogenic belt.

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Metallogenic possibility of large-scale Copper-Gold deposit in Anhui

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Anhui Province, located in East China, is an important part of the circum-Pacific metallogenic belt. It is an area with relatively abundant coal, iron, and copper deposits but rare gold resources. Plenty of geological, geophysical, and geochemical data have been accumulated for the purpose of mineral resource exploration. Based on these data, this study discusses the possibility of re-finding large-scale Copper-Gold deposit in the area.

The study was done according to the following steps: (1) analysis of existing research results, including gravity, magnetism, geochemistry, remote sensing data and GIS information. (2) Combination of new prospecting methods, using the digital image system processing function, to prospect the big ore on the analysis of the existing small one, and prospecting the rich ore on the basis of the existing lean ore. (3) Solving structure problems by gravity and magnetism, and considering the metallogenic anomaly, extracting the ring image, concealed structure, and the activity condition of deep magma chamber by remote sensing data. Discovering the mineral abnormality from geochemistry.

The results show that there are metallogenic possibilities of prospecting large-scale Copper-Gold deposit in the areas with the following tectonic settings: (1) metallogentic areas gathering small ore deposits and mineralized spots; (2) edge contact zones of large magamtic bodies or the multiply ascensive channel remelting belts of magmatic bodies; (3) bonding-zones of the first-class geotectonic units; (4) convergence zones of deep faults; (5) gradient zones of the Moho, connecting zones and rock branchs of deep magma chambers; (6) extended structure zones and fault tectonic zones of large-scale copper-gold mines in areas adjacent to the Anhui province.

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