LA-ICP-MS *in situ* trace elements analysis of apatite and magnetite from Taocun iron deposit, Anhui Province, China

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Ningwu volcanic basin located in the easternmost portion of the Middle-Lower Yangtze River metallogenic belt, which is an important Fe-S-Cu-Au mining district. A large number of iron deposits occurred in the Ningwu basin. The Taocun iron deposit is an important large deposit composed mainly of magnetite-apatite-actinolite assemblage that can be well compared with the Kiruna type iron deposits.

LA-ICP-MS data show that magnetite in Taocun deposit have detectible Ti, Mg, Al, V, Ni, Co, Zn, Ga, but the co-genetic apatite contains detectible Mg, Al, Si, K, Ca, V, Cr, Mn, Sr, Th, U and REE. The apatite of the Taocun deposit has a content of 5568-7930 ppm REE with a strong LREE/HREE fractionation and negative Eu anomalies, which is in similar to that of apatite in Kiruna deposit in Sweden (Figure 1). The REE distribution in the host rocks (gabbro-diorite porphyry) of the deposit have a significant difference REE pattern.

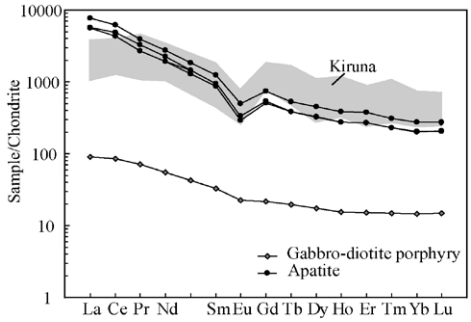

Figure 1: Condorite-normalized REE pattern of hostrock and apatite from Taocun iron deposit.

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Geochemistry and petrogenesis of foliated (garnet-bearing) granites in the Tongbai-Dabie orogenic belt

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Foliated (garnet-bearing) (FGB) granites are associated closely with and are usually the major wall rocks of the high-pressure (HP) and ultrahigh-pressure (UHP) metamorphic rocks in the Tongbai-Dabie region. These granites are rich in Si and alkali with high Ga/Al ratios, and depleted in Ca, Mg, Al, Ti, Sc, V, Ni, Co, Cr and Sr, which are similar to the A-type granite. In conventional discrimination diagrams, these FGB granites belong to A-type granite, with geochemical characteristics affinitive to post-collisional granites. The εNd (230 Ma) values (-15.80–-2.52) and TDM values (1.02–2.07 Ga) suggest that magma for the FGB granites were derived from a heterogeneous crustal source. Therefore, the FGB granites may provide clues for deciphering the formation of post-collisional granites. We propose that the magma of the FGB granites both in the HP and UHP units was formed in an extensional tectonic setting slightly postdating the HP and UHP metamorphism, likely through decompressional partial melting of UHP retrograded eclogites during exhumation.

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