

# Gold contents of Meso-Cenozoic basalts in eastern China: Implication for gold origin of giant gold deposits in the North China Craton

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The gold deposits at the eastern margin of the North China Craton (NCC) are globally noticeable because of large-scale gold mineralization (>4000 T reserves). More importantly, they are difficult to be ascribed to orogenic gold deposits, given their formation at around 120 Ma, far younger than the Archean-Proterozoic NCC basement and supracrust. A popular hypothesis infers that the Mesozoic enriched lithospheric mantle of NCC ( $\epsilon_{\text{Sr}(t)}=11\sim 147$ ,  $\epsilon_{\text{Nd}(t)}=-1\sim -13$ )[1] is anomalously enriched in gold and probably provides much gold for the giant gold deposits during destruction of the NCC[2]. Unfortunately, little gold content is available to test this hypothesis directly. Here we have determined gold and platinum-group element contents of basalts in eastern China which erupted before and after gold mineralization. Our preliminary data show that basalts before mineralization have a range of < 1 ng/g to 4 ng/g Au and relatively high PGE contents. In contrast, the basalts erupted after mineralization display lower Au (mostly < 1 ng/g, n=17) and PGE contents.

Although more work is necessary to better understand the effect of basalt petrogenesis on Au and PGE contents and the reasons for the relatively higher Au and PGE contents in some basalts erupted before gold mineralization, the whole-rock Au contents of basalts likely suggest low Au content in the NCC lithospheric mantle, which may be not obviously higher than the depleted mantle of 1-2 ng/g. If true, the Mesozoic enriched lithospheric mantle of the NCC may not play a unique role in the gold mineralization. Instead, magmatic evolution should be the key factor for Au enrichment for large-scale deposits.

[1] Zhang *et al.* (2008), *CMP* **155**, 271-293. [2] Zheng *et al.* (2005), *GCA* **69**, 3401-3418.