Tectonic Background of Guixi Mafic-type Gold Deposits, South China: Mantle Plume-Subduction Interaction

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The South China tectonic block (SCB) is bounded to the north by the Qinling-Dabie orogenic belt, and to the west and southwest by the Tibetan and Indochina blocks. The late Paleozoic mafic rocks (diabase and basalt) in the SCB are concentrated in the southwest region (western Guangxi) of the block, also called as Guixi, a special transitional zone where influenced by the eastern Paleo-Tethyan tectonic regime in the early Paleozoic to being influenced by the paleo-Pacific tectonic regime in the late Mesozoic. Specially, economically significant gold mineralizations in Guixi are genetically associated with mafic rocks. However, the causes of magmatism and related gold deposit tectonic background in Guixi during the late Paleozoic to early Mesozoic are strongly contested. Two drivers have proposed: influenced by the Paleo-Tethyan oceanic plate subduction or Emeishan mantle plume.

We combine the new geochemical data of Guixi Ore-bearing and barren mafic rocks with previous results to show that the geochemical characteristics of the bulk of mafic rocks range from calc-alkaline arc basalt-like to tholeiitic enriched mid-ocean ridge basalt (E-MORB)-like and alkaline ocean island basalt (OIB)-like. Their trace element concentration patterns range from depleted to enriched, especially Ti, Nb and Ta from depleted arc-like to enriched OIB like, indicating a subduction-influenced to plume origin. Owing to the Guixi located in the outer zone of Emeishan flood-basalt province, we suggest the ore forming events and related magmatism were probably related to the Paleo-Tethyan oceanic plate subduction interaction with Emeishan mantle plume.

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