Genesis and magmatic emplacement model of the Himalayan intrusions from Baoxingchang area, Western Yunnan

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Baoxingchang Cu-Mo deposit is located in the joint of the west Yangtze Plate and the east Jinshajiang-Red River fault. Based on detailed field works and geochemical data, it confirmed that the Baoxingchang magma evolves four intrusion s accompanied with two mineralizations (the II stage and III stage):

I stage: yenite porphyry or quartz syenite porphyry → II stage: porphyritic granite + early lamprophyre → III stage: granite porphyry + late lamprophyre → IV stage: alkali-feldspar granite-porphyry, which suggests that the multi-stage magmas are homologous and act with pulsation rising over the same period.

On the basis of analysis above for time-space evolution of magma, source characteristics and magmatic genesis, a model of the four-stage magma with fluid pulsationally aroused was built in this paper (Figure 1).

It indicates that mantle heat flow from Eastern Margin of Tibetan Plateau underplated to the bottom of the mantle lithosphere to constitute a magmatic circulatory system with low pressure and heterogeneous temperature, which occurred endless crust-mantle mixing. The crust-mantle mixation zone provides primary magma for alkaline-rich intrusions which experiences partial melting, crust-mantle mixing as well as fractional crystallization during the ascend processes of magma along a dilation center between Red River fault and Chenghai fault to emplace multi-stage and multi-type intrusions. In this evolution process, the I stage syenite porphyry rocks are higher depth of magma source, higher partial melting degree, lower SiO2 components and weaker crystallization differentiation. The II stage granite rocks, as a main intrusion, have shallower depth and weaker partial melting degree of magma source, but larger scale outcrop, stronger crystallization differentiation and more crustal contamination than the I stage rocks, which consists of porphyritic granite and granite porphyry with contaminations of old basement of Yangtze Croton (0.7~1.0Ga).

The IV stage alkali-feldspar granite-porphyry have similar depth of magma source and crystallization differentiation, while it is smallest outcrop and lowest partial melting degree. Furthermore, early lamprophyre and late lamprophyre, with the deepest magma source and reduced scale, intruded following porphyritic granite and granite porphyry, respectively.

Figure1 The magmatic emplacement model in Baoxingchang