

## Isotopic data from granulites of the Eastern Ghats belt, India, linked to petrological processes through textural evidence

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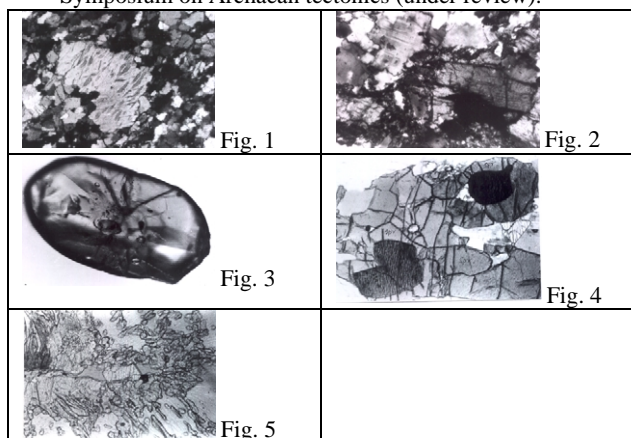
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Synkinematic melting and emplacement of charnockitic melt, of tonalitic composition, dated c. 3.0 Ga by whole rock Rb-Sr and Pb-Pb zircon dating (Bhattacharya et al. 2001), is evidenced by a) directional flame perthite; b) moat of fine grained orthopyroxene around orthopyroxene porphyroblast; and c) rounding of prism faces of zircon.

Isobaric cooling of the order of 200 °C recorded in the high-Mg-Al-sapphirine granulites (Bhattacharya and Kar, 2002) is represented by a) coronal sapphirine on spinel and b) osumillite breakdown to orthopyroxene-cordierite-K-feldspar-quartz intergrowth. Difference of U-Pb ages of zircon and monazite c. 100 Ma represents duration of this cooling (Bhattacharya and Basei, 2002). Thus a cooling rate of c. 2 °C/Ma can be derived.

### References

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## REE and Sr, Nd isotopic geochemistry of alkaline intrusion related to Au and Cu mineralization in Ailaoshan - Jinshajiang alkaline intrusive belt, southwestern China

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The NW-NNW trending Ailaoshan-Jinshajiang fault zone is one of the biggest strike-slip systems on Earth related to escape tectonics from the India-Eurasia collision. The large Ailaoshan-Jinshajiang alkaline intrusive belt is developed along or near the zone. This magmatic belt formed in Himalayan is over 2000 km long and generally 50-80 km wide. In recent years numerous gold and copper deposits were discovered in this area, which are spatially related to and contemporaneous with these alkaline intrusions. Recent studies showed that there are genetic connections between alkaline magma and mineralization. We examined two alkaline intrusions in the belt, Yao'an syenite porphyry intrusion related to Au mineralization and Machangqing granite porphyry intrusion related to Cu mineralization.

The REE contents of Yao'an porphyry range from 441.7 to 688.1 ppm, with  $(La/Yb)_n$  37.6 to 81.9,  $(La/Sm)_n$  5.3 to 7.3. It has weak negative Eu anomalies ( $Eu/Eu^* = 0.88$  to 0.94).  $^{87}Sr/^{86}Sr$  ratios vary from 0.7094 to 0.7156, and  $\epsilon Nd$  ranges from -15.4 to -21.0. The REE contents of Machangqing porphyry vary from 119.4 to 251.5 ppm, with  $(La/Yb)_n$  29.9 to 40.2,  $(La/Sm)_n$  5.7 to 7.7,  $Eu/Eu^* = 0.79$  to 0.95,  $^{87}Sr/^{86}Sr = 0.7079 - 0.7091$ ,  $\epsilon Nd = -2.4$  to -10.8. The REE and Sr, Nd isotopic compositions of both intrusions show the composition of an enriched lithospheric mantle. Parallel REE distribution patterns and positive correlations between La and La/Sm ratios in both intrusions suggest they were derived from partial melting of the same source. However, the evidences from geological structure and petrology, combined with the consideration of slightly different isotopic compositions and REE content in both intrusions, suggest a derivation by different degrees of partial melting from an enriched lithospheric mantle and also the different characteristics of mineralizing fluid derived from both intrusions.