

Paper Number: 3535

**LATE ARCHAEOAN ALKALI SYENITE PLUTON FROM KOPPAL, KARNATAKA STATE, SOUTH INDIA: AN EMPLACEMENT DURING THE ACCRETION OF THE DHARWAR BATHOLITH**

David Kummera<sup>1</sup>, Ramesh Samala<sup>2</sup>

<sup>1</sup>Department of Geology, Kakatiya University, Warangal-506009-INDIA. E-mail: [davidkummera@yahoo.co.in](mailto:davidkummera@yahoo.co.in)

<sup>2</sup>Geological Survey of India, Bhopal-462016-INDIA.

---

Alkaline magmatism did not carry out its activities on the planet Earth until the beginning of Late-Archaean age although the manifestations of which are found in very few parts including India where the Dharwar Craton in Southern Peninsular India offered the platform to host a Late Archaean syenite body at Koppal in the state of Karnataka. The host Dharwar Craton is predominantly represented by Calc-Alkaline granite with subordinate components of granodiorite, diorite and gabbro. The oblong syenite pluton, trending in the NE – SW direction, occupies an area of about 115 sq.kms. and it has a sharp contact with the surrounding granite gneisses. The Koppal alkali syenite, with a sub-solvus assemblage, is predominantly composed of coarse to medium grained microcline perthite with a subordinate amount of sodic plagioclase. Bluish green amphibole and pale green clino-pyroxene constitute the mafic component. Neither quartz nor nepheline could be found in these rocks although small outcrops of quartz syenites are also scarcely found distributed.

The Koppal alkali syenites are Ne normative and a majority of them are also Ac normative thereby proving their alkaline character. Significant enrichment in the contents of Ba, Sr and Zr can be found in almost all the analyzed samples. According to mineralogical and geochemical characteristics, these rocks come under the miaskitic category. In the chondrite normalized REE plot, all the Koppal syenites, without exception, show a contrasting pattern of LREE enrichment and HREE depletion. A sample of Koppal syenites has given the SHRIMP Ur/Pb age Zircon age of  $2528 \pm 9$  Ma (Chadwick et al, 2001) [1].

The rare occurrence of alkaline rocks during the Late Archaean time and the resultant scarcity during that period is “attributed to higher degrees of partial melting in hotter Archaean mantle than that in the Phanerozoic”. An enriched mantle has been envisaged for producing the source for the generation of alkaline magma not only at Koppal, but elsewhere in the world.

*References:*

1. Chadwick B (2001) Journal Geological Society of India, 58, 381-390.

