

Geochemistry of shales from the late-Archean Chitradurga Greenstone Belt, Karnataka, southern India

T. GNANESHWARA RAO¹, B. UDAY RAJ¹, D.V. SUBBA RAO AND B. SREENIVAS¹

¹ National Geophysical Research Institute, Hyderabad 500007, India; raotgn@rediffmail.com

Archean shales have been collected from three different stratigraphic horizons namely Vanivilas, Ingaldhal and Hiriyur Formations representing the lower and upper levels of Chitradurga greenstone belt (CGB). These shales/pelites are characterized by mica-quartz-chlorite±graphite mineralogy. The high Al_2O_3/TiO_2 values, enriched incompatible and HFSE indicate a greater abundance of detrital and residual heavy minerals. REE patterns of the three different formations are similar, absence of negative Eu anomalies, LREE enrichment and flat HREE (Fig. 1). One sample belonging to the Vanivilas Formation shows strong negative Ce anomaly indicating perhaps prevalence of localized oxygenated environment as evidenced by the occurrence of stromatolites. These patterns are also similar to the Fig Tree Groups in South Africa [1] and indicate contribution of detritus from source rock types to the basin. La/Th, Th/Sc, Co/Th and Cr and Ni distributions in these pelites show a mixed provenance. High Chemical Index of Alteration (CIA) and depletion of Sr and CaO in the multi-element plot normalized against average Archean Upper Crust (AUC) indicate intense chemical weathering of the source terrain. The Chitradurga pelites on an average are more mafic in composition than the post-Archean sediments indicating strong similarities to that of Archean turbidite deposits.

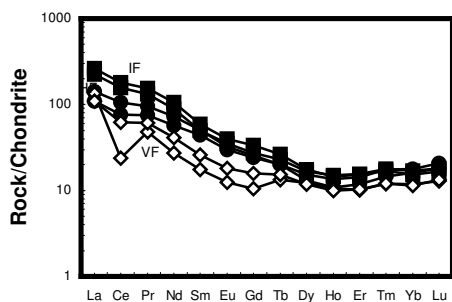


Fig. 1 REE patterns of shales from three different stratigraphic formations of the CGB, Southern India.

References:

- [1] Hofmann. A. (2005) *Precamb. Res.* **143**, 23-49.