

Petrogenesis of peridotitic komatiites from two Mesoarchean greenstone belts of Sargur Group, western Dharwar craton, southern India

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The ultramafic rocks of the Holenarsipur and Nuggihalli greenstone belts (HGB and NGB) exhibit distinctive lithological and geochemical characteristics with implications for their petrogenesis. This may be due to the exposure of different crustal levels, with the deeper eroded crust exposed in NGB. The LREE-enriched chondrite-normalized patterns for the HGB rocks may be due to the fractionation of relatively MREE- and HREE-enriched minerals such as pyroxenes and olivine during early stages of differentiation or due to contamination by crustal rocks, while flat REE patterns are shown by the layered intrusives of NGB. Almost all of the rocks also show negative Nb and Ti anomalies. The ultramafic rocks from HGB are Al-depleted while NGB ultramafic rocks are both Al-undepleted & Al-depleted, implying presence of garnet as a melting phase in one system while it remained as a residual phase in the other. Mobility of trace elements has been found to be negligible. The Nb/Yb - Th/Yb plot suggests an N-MORB affinity for the ultramafic rocks with the trajectory of the scatter of the sample points away from the MORB-OIB array similar to the crustally contaminated MORB-type [1]. The present day architecture of the greenstone belts of Sargur Group present as linear belts tucked within TTG gneisses could have been achieved by sub-contemporaneous intrusion of these rock units with varying degrees of contamination and differentiation. One plausible tectonic setting could have been due to subduction initiation of an upwelling mantle in a mid-oceanic ridge.

References: [1] Pearce, J.A. (2008) *Lithos* 100, 14-48.