

Rare earth element and yttrium compositions of Paleoproterozoic BIFs and Carbonates of Gwalior Basin, Bundelkhand Craton, India

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The 1914 to 1733 Ma old Gwalior Group of the Bundelkhand preserves a continuous sedimentary-volcanic rock record. The Gwalior sediments comprise the lower Par Formation having sandstones and shales, and the upper Morar Formation consisting BIFs, carbonates, and tuffaceous shales. Here, we present REY data of carbonate rocks as well as the BIFs of the Morar Formation.

We analyzed the REY compositions of whole-rock, leachate, and residual part carbonate samples. The REY patterns of all three fractions are found to be similar. PAAS normalized REY patterns of carbonate rocks show no Ce anomalies indicating no significant oxidative conditions during their precipitation. The reported $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ values for the same indicate deeper facies marine carbonates and are similar to many Paleoproterozoic carbonate successions worldwide of the Late Paleoproterozoic age.

REE patterns for BIFs from the Morar Formation (normalized to PAAS) show moderate depletion in the LREE, enrichment of the middle to heavy REE, insignificant to high positive Eu anomalies, and minor negative Ce anomalies. The positive Eu anomalies could be suggestive of a hydrothermal source. A small magnitude of negative Ce anomalies in BIFs indicates that seawater from which BIFs were precipitated might be slightly oxic.