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Geochemical Study of Chirimiri Sandstones of Talchir Formation, Son-Mahanadi Gondwana Basin, Chhattisgarh, India

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Abstract

The geochemical study of the Chirimiri sandstones of Talchir Formation has been carried out to investigate about the provenance, weathering signatures and tectonic setting. Major oxides suggest that the Chirimiri sandstone is compositionally immature with low content of SiO_2/Al_2O_3 ratio. It is arkose to lithic-arenite type. The weathering indices like CIA and CIW and Th/U ratio suggest that Chirimiri sandstones suffered low to moderate chemical weathering. The chondrite normalised REE patterns of enriched LREE and flat HREE with negative Eu/Eu^* anomaly along with trace element ratios of Th/Sc, Cr/Th and Zr/Sc suggest that these sediments were dominantly derived from the rocks of intermediate composition. Among these rocks some contains high Gd/Yb and HREE content. The Chirimiri sandstones were derived from passive margin setting, where the basin had undergone local (small scale) rifting prior to Gondwana disintegration. The Chirimiri basin can also be considered as a locally pull-apart basin and its sediments show geochemical signatures analogous to the basins of active continental margin setting.

Keywords: Geochemistry, Lower Gondwana, Chirimiri sandstones, Talchir Formation, Son-Mahanadi Gondwana basin, India.