

SOURCE ROCKS AND PALEOWEATHERING CHARACTERISTICS OF TRIASSIC SEDIMENTARY ROCKS FROM SPITI REGION, TETHYS HIMALAYA, INDIA

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Abstract

The Spiti region of Indian Tethys Himalaya is known for profuse development of fossiliferous Phanerozoic (particularly Triassic) sedimentary sequence. However, negligible geochemical information about these rocks from this region is available. In order to fill this gap, a Triassic siliciclastic sedimentary rock sequence (consisting of shales and sandstones) belonging to Tambakurkur, Sanglung and Nimaloska Groups is selected in the present study and substantial information about the provenance, paleoclimate and paleo-weathering conditions of the source rocks is documented. Petrography of Spiti sandstones indicates the presence of dominant monocrystalline quartz with a minor amount of polycrystalline quartz, feldspars and lithic fragments. Geochemical studies reveal that shales are enriched in felsic elements and depleted in mafic components. Petrographic characteristics (such as high percentage of quartz, with plagioclase, k-feldspar and micas) coupled with provenance discrimination diagrams based on geochemical ratios strongly indicate that the Triassic Spiti sedimentary rocks may have been derived from felsic (granitic) source rocks. Different chemical weathering indices suggest that the source rocks of the studied sequence may have undergone moderate to an intense degree of chemical weathering, which in turn indicates prevalence of varying climatic conditions in the source.

Keywords: Spiti region, Geochemistry, Triassic sediments, Provenance, Paleoweathering, Paleoclimate.