

Geochemistry of the Triassic–Jurassic lateritic bauxites of the Salt Range: implications for eastward extension of the Tethyan bauxite deposits into Pakistan

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Bauxite deposits are residuals of intense lateritic weathering under warm and humid palaeoclimates. The Triassic–Jurassic Boundary (TJB) interval in the Salt Range, Pakistan, provides one such case of bauxite deposits formation along the SW tropical Neo-Tethyan passive margin. Thick, red bauxites/bauxitic clays occur at the contact of the Upper Triassic Kingriali Formation and the Lower Jurassic Datta Formation. These bauxites are rich in kaolinite, haematite, boehmite (Al_2O_3 and Fe_2O_3), and are depleted in silica (SiO_2). Geochemical proxies of the succession signal intense chemical weathering of the parent siliciclastics under Mesozoic “greenhouse” conditions. Certain trace elements and Rare Earth Elements (REEs) are enriched up to seven times compared to mean Upper Continental Crust (UCC) values. These bauxites are synchronous with the Amir-Abad bauxites

of the Alborz Mountains, central Iranian Plateau, that occur between the thick Triassic dolomite/dolomitic limestones of the Elika Formation and the Lower Jurassic Shemshak Formation. Thus, the Salt Range, Pakistan, provides evidence for the eastward extension of the Irano-Himalayan bauxites that are extended westward into Mediterranean bauxites, and the western Tethys by correlation with European bauxites. The TJB bauxites in the Salt Range support increased chemical weathering on the SW Neo-Tethyan passive margin and correspond to an associated sea-level fall during this time interval. This supports the Neo-Tethyan tectonics contribution in the formation of bauxite deposits during the Triassic–Jurassic in addition to the widely studied karst-bauxites that formed in response to the subduction and orogenic processes in the Paleo-Tethys.