

GEOCHEMISTRY AND PETROGENESIS OF ARENITES AND SHALES OF TIRATHGARH FORMATION OF INDRAVATI BASIN, BURGIBHATA AREA, BASTAR DISTRICT, CHHATTISGARH

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Abstract

Tirathgarh Formation constituting the basal part of Indravati Group rests unconformably over a basement consisting mainly of the Palaeoproterozoic Darba Granite. This formation comprises predominantly arenites with intercalation of shales. Geochemical and petrogenetic studies have been carried out on borehole and surface samples collected from Burgibhata area. In general arenites of Tirathgarh Formation are characterised by higher SiO₂ (94.02%) content and lower content of TiO₂ (0.06%), Al₂O₃ (3.16%), FeO^T (1.34%), MgO (0.14%), MnO (0.01%), CaO (0.05%), Na₂O (0.36%), K₂O (0.68%) and P₂O₅ (0.02%) as compared to the values of Upper Continental Crust (UCC). Among the trace elements V, Cr, Co, Ni, Cu, Zn, Pb, As and U contents are higher than the values of UCC while Rb, Ba, Sr, Zr, Nb, Ce, Y and Ga are less than the UCC concentrations.

Shales of the area are characterised by lower content of SiO₂ (60.43%), TiO₂ (0.90%), MgO (1.37%), CaO (0.10%), Na₂O (0.82%) and P₂O₅ (0.07%) with a higher content of Al₂O₃ (22.36%) and K₂O (6.59%) in comparison to Post Archaean Average Shale (PAAS). Further in comparison to PAAS, these shales contain higher concentration of V, Cr, Co, Ni and Rb and lower concentration of Cu, Zn, Sr, Zr, and Ba. Provenance for these sediments are the granites and quartzite bearing metasediments of Bengal Group derived under strong chemical weathering and a humid climatic condition. Sedimentation processes took place in a shallow shelf with relict shoreline environment in the passive margin tectonic setting.

Keywords: Geochemistry, Petrogenesis, Tirathgarh Formation, Indravati Basin, Bastar