

Geochemistry of the granitoid rocks of Sausar belt, central India: implications for evolution of the Central Indian Tectonic Zone

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The Sausar mobile belt of the Central India Tectonic Zone (CITZ) comprises felsic gneisses forming the basement complex and Paleoproterozoic metasediments of the Sausar Group overlying the basement. The metasediments of the lower part of the Sausar Group were originally deposited in a glacial environment and chemogenic sediments (carbonates and manganese-bearing rocks) form the upper part. The chemogenic sediments of the Sausar Group provide valuable geochemical clues regarding the evolution of the atmosphere-ocean system at the Archean-Paleoproterozoic boundary. The tectonic evolution of the CITZ, however, is debated for lack of sufficient geochemical data from the basement and cover rocks of the region. An extensive study was carried out on the gneisses and granites of the Ramtek area, Maharashtra to constrain the petrogenesis of the granitoid rocks and age of emplacement of the granitic intrusions within the basement gneisses. The bulk rock geochemistry shows that the granites have high SiO₂ (60.02-76.93%), moderate Al₂O₃ (12.12-14.08%), CaO (0.09-1.31%) lower than Na₂O+K₂O (7.64-9.59%), TiO₂ (0.05-0.80%), MgO (4.18-5.24%) and A/CNK value of 0.5-1.70 and are metaluminous to peraluminous in nature. In the chondrite normalised and the primitive mantle normalised spider diagrams of the granites enrichment in LREE and LILE (Cs, K, Pb, Zr), depletion in HREE and HFSE (Nb, Ta, Ti, P), and negative Eu-anomaly of 0.059-0.783 are observed. The study suggests that the granitoids are A-type granites and were developed in a within plate setting.