

PETROLOGY AND GEOCHEMISTRY OF THE GRANITOIDS OCCURRING WITHIN NELLORE SCHIST BELT, RAPUR AREA, NELLORE DISTRICT, ANDHRA PRADESH.

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Abstract

Rapur area forms the southern part of Nellore Schist Belt (NSB) of Andhra Pradesh and exposes metabasalt, quartz-mica schist, quartzite, undifferentiated granitoids of PGC II and younger acidic and basic intrusives. The unclassified granitoids of the area have been mapped and classified on the basis of their mineralogical and geochemical characteristics into two suites viz.: 1. Tonalite-Granodiorite-Monzonite suites (TGM) and 2. Monzonite-Syenite suite (MS). TGM suite is predominant in the study area and mainly consists of hornblende-biotite gneiss and orbicular granite. Hornblende-biotite gneisses are tonalitic to granodioritic in composition and the gneissosity is defined by parallel alignment of mafic and felsic minerals. Gneissosity plane is parallel to the schistosity of metabasalt of NSB trending NW-SE, defining the regional foliation trend in the area. The orbicular granite, a variant of hornblende-biotite gneiss, contains oval to orb-shaped phenocrysts of plagioclase and K-feldspar set within a fine grained matrix of quartz, feldspars, biotite and hornblende. The MS suite of rocks consists of alkali feldspar granite and monzogranite, which are exposed near Marlapudi and NE of Rapur. The granitoids of the present study show low Ti, Zr, CaO, FeO, MgO and higher Sr and Ba concentrations. The mineralogical heterogeneity is reflected in the major and trace elemental abundance. The gneisses of the study area show low to moderate Rb and high Sr content and calc-alkaline affinity with high K₂O content. They are meta-aluminous in nature and are predominantly tonalitic to granitic in composition and exhibit enriched LILE (Ba, Rb, Th, U, K) and HFSE (Nd, Zr.), but strongly depleted Sr, P and Tb content. These granite characteristically have enriched LREE, relatively flat to slightly depleted HREE patterns with negative Eu anomaly. Negative Eu anomaly in granitoids of Rapur is pronounced, indicating variation in degree of plagioclase fractionation and REE partitioning. LREE enrichment, negative Eu anomaly and flat HREE patterns indicate an enriched lower crustal source for these granites.

Keywords: Nellore Schist Belt, Nallamalai Fold Belt, Tonalite-Granodiorite-Monzonite, Monzo-Granite