

PETROLOGICAL AND GEOCHEMICAL STUDIES OF PRECAMBRIAN GRANITOIDS FROM KATTANGUR AND NAKREKAL AREA OF NALGONDA DISTRICT, TELANGANA, INDIA

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Abstract

The granitoids from the Kattangur - Nakrekal area of Nalgonda District are confined to the Precambrian gneissic complex in the northern-eastern part of Eastern Dharwar Craton. They cover 130 Sq.km of the study area and fall between Latitudes: 17°07'30"N to 17°12'30"N and Longitudes: 79°12'30"E to 79°25'00"E. The granitoids are mainly classified into grey and pink granites, granodiorites and quartz-monzodiorites. They occasionally contain older mafic enclaves in the form of lensoid bodies and thin bands and cut by younger dolerite dykes, gabbroic dykes, pegmatite and quartz veins. Granitoids form hillocks, small mounds, sheeted outcrops and batholithic domes in the study area. They plot in the field of monzo-granite, granodiorite and quartz-monzodiorite in QAP diagram of Streckeisen (1974 and 1976). Under the microscope they show varied textural features such as intergrowth perthitic texture between alkali feldspar and plagioclase feldspar and symplectic myrmekitic texture between plagioclase, quartz at the margin of K- feldspar. They are mainly composed of feldspar (microcline and plagioclase) and quartz as essential minerals. Biotite and hornblende form minor minerals, and epidote, chlorite, apatite and iron oxide occur in trace amounts. The negative correlation between SiO₂ vs CaO, TiO₂ and MgO indicates plagioclase fractionation as well as differential crystallisation and hence classified as granite-granodiorite and quartz-monzodiorite. These granitoids lie in the fields of granite, granodiorite and diorite in the SiO₂ vs Na₂O+K₂O diagram (after Cox et al., 1979). Majority of granitoid samples fall in granite, few in quartz-monzonite, monzodiorite and gabbroic, dioritic fields in the Na₂O+K₂O vs SiO₂ binary diagram of Middlemost, (1994). The granitoid samples are classified into granites granodiorites and tonalite (GGT) in the normative An-Ab-Or ternary diagram of Barker and O'Connor (1965). The granitic rocks in the study area plot within the calc-alkaline field and show typical calc-alkaline trend in the AFM diagram of Irvine and Baragar (1971). In Shands diagram the granitoids define both metaluminous and peraluminous types. When we plotted the granitoids of Kattangur-Nakrekal area in the MALI digram, they spread from calcic to alkali fields without being confined to any single field. This shows that the studied suites are not derived by differentiation of a single parental magma. These granitoids are described as subsolvus in character due the presence of two feldspars that are formed below the solvus (<400°C) temperature under wet conditions. Based on the field evidence, petrography and major element analyses the granitoids of Kattangur and Nakrekal area reveal that they were formed from melts that were generated by partial melting of the lower crust due to magma-upwelling.

Keywords: Precambrian gneissic-granitoids, perthitic, myrmekitic, QAP diagram, MALI, subsolvus, partial melting, lower crust and magma-upwelling