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PETROLOGICAL AND GEOCHEMICAL STUDIES OF MAFIC ROCKS FROM THE KATTANGUR- NAKREKAL AREA OF NALGONDA DISTRICT TELANGANA STATE, INDIA

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Abstract

Mafic dykes are episodic and extensive in many Precambrian cratons and important strain and time markers. They show a wide span of igneous intrusion event between 2.4 Ga to 0.650 Ga in Eastern Dharwar Craton, India. Field observations reveal that there are three important major dyke trends along E-W, N- S and NE- SW around Kattangur and Nakrekal areas in Nalgonda district. The mafic dykes are in the form of dolerites and amphibolites, occurring as enclaves in the country rocks. The amphibolites show excellent foliation and are abundant in gneissic grey granitoids. They show both sharp and gradational contact relationships with the granitoids in the study area and contain quartzo-feldspathic veins along fractures in these enclaves, and mainly consist of hornblende, biotite and plagioclase. The dolerite dykes has a cross-cutting relation with granitoids and shows a varying width (10m to 70m) as well as length. These rocks are essentially composed of plagioclase feldspar (labradorite) and pyroxene (augite). They show ophitic to sub-ophitic textures with randomly oriented plagioclase laths embedded in coarse pyroxene crystals. The dykes in the study area have chemical and petrographical characteristics typical of tholeiitic basalts and basaltic-andesite such as the marked enrichment of Fe_2O_3 from 15.16 to 11.81wt % and the presence of MgO from 9.48 to 5.94 wt%, Cr 328.47 to 106.2 ppm and Ni 63.7 to 26.33 ppm. The most Mg rich samples - 30 and 31are olivine bearing rocks. The trace element contents vary with relatively large ranges: reflecting that the immobile elements Y, Zr and Nb are correlated and generally increase with decreasing MgO. The Chondrite normalized rare earth element profiles show at least two different shapes, one characterized by slight to heavy REE fractionation (amphibolite) and LRRE enriched pattern, while the other shows flattened LREE enriched fractionation (dolerite) patterns.

Keywords: Dharwar craton, igneous intrusions (dolerites), amphibolites, granitoids and quartzo- feldspatic veins.