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GEOLOGY, GEOCHEMISTRY AND TECTONIC SIGNIFICANCE OF PROTEROZOIC MAFIC DYKES FROM CHITTOOR CLUSTER, SOUTH OF CUDDAPAH BASIN, INDIA

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Abstract

Mafic dykes are a kind of minor intrusions usually occurring within granitic plutons commonly exemplified by the Chittoor dyke cluster, south of Cuddapah Basin, Eastern Dharwar Craton. A number of mafic dykes having two distinct geological and geochemical characteristics are identified in the Chittoor dyke cluster, the origin of these dykes has been studied here through detailed petrographic and geochemical investigations. The analytical results suggest that the mafic dykes in the Chittoor cluster are subalkaline to dolerite, derived from a continental arc source. The mafic dyke samples contain 5.7 wt% MgO; exhibit negative Ba, Nb, Sr, Zr and Ti-anomalies and are enriched in Cs, Rb, U, K, Nd and Sm. It is suggested that these mafic dykes were subduction related and contaminated during theiremplacement. After reviewing the existing basic data of the Proterozoic geology and geochemistry in Chittoor dyke cluster south of Cuddapah Basin, as well as the geochemistry of the mafic dykes in the Chittoor dyke cluster, it is suggested that mantle wedge melting during the subduction process and basaltic underplating had provided the necessary heat to cause partial melting of the continental crust, leading to the generation of voluminous amount of calc-alkaline magma seen presently as the Chittoor dyke cluster.

Keywords: Geology, Geochemistry, Chittoor dyke cluster, Cuddapah Basin.