

GEOCHEMISTRY OF GRANITOIDS ALONG THE EASTERN MARGIN OF EASTERN DHARWAR CRATON, SOUTHERN INDIA AND THEIR TECTONIC SETTING

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Abstract

Along the south-eastern margin of Eastern Dharwar Craton (EDC), granitoid magmatism took place during Proterozoic era. These granitoid plutons were the result of orogenic and anorogenic or rift related tectonism. We have studied the geochemical characteristics of a few of these granitoids situated at Vinukonda, Putchanuthala, Darsi and Podili which show geochemical and tectonic setting variations. Si-saturated, metaluminous and alkali-calcic Vinukonda and Putchanuthala granitoids emplaced under collisional/orogenic tectonic setting, are geochemically characterized by a strong negative Eu anomaly (-5.5 to -58.9), total REE ("REE") of 249 to 723 ppm, "LREE from 207 to 644 ppm, "HREE from 31 to 78 ppm and "LREE/"HREE ratio in the range of 6 to 10. The Darsi granitoids characterized by silica-saturated, metaluminous, alkali-calcic nature have been emplaced under a late to post-orogenic tectonic setting prior to the next anorogenic activity. Geochemically these granitoids show 72-75.5% SiO₂, 12.8-13.9% Al₂O₃, 8.8 to 9.9% total alkalies, strong negative Eu anomaly (-62.7 to -127.9), 512 to 1005 ppm "REE,"LREE from 418 to 800 ppm, "HREE from 93 to 206 ppm and "LREE/"HREE ratio in the range from 3.5 to 5.9. The peralkaline to metaluminous, alkalic to alkali-calcic natured Podili granitoids located south of Darsi, are geochemically characterized by 69.56-74.13% SiO₂, 0.83 to 0.99 A/CNK, strong negative Eu anomaly (-20 to -82.8), 402 to 1317 ppm "REE, "LREE from 372 to 1232 ppm, "HREE from 28 to 85 ppm and "LREE/"HREE ratio in the range from 12.6 to 32.5. All these granitoid plutons except for Podili have a similar deformational trend of N55°W- S55°E to N60°W- S60°E and host lensoidal microgranular magmatic enclaves that have resulted due to magmatism coupled with orogeny.

Keywords: Eastern Dharwar Craton, Granitoid pluton, Orogenic, Anorogenic, silica-saturated, collisional/orogenic tectonic setting.