Geophysical Research Abstracts
Vol. 21, EGU2019-9670, 2019
EGU General Assembly 2019

Mineralogy and geochemistry of ferrosyenites from Cuddapah Intrusive Province: Implications for petrogenesis and tectonic setting

Ragi Mallikarjuna Reddy and Kandukuri Saikrishna
Kakatiya University, Geology, Warangal, India (mallikragi@gmail.com)

The rare ferrosyenites in India are reported from four places namely Gundlapalle, Gokanakonda and Uppalapadu plutons of Cuddapah intrusive province (CIP) in Andhra Pradesh and Sivamalai pluton of southern granulite terrain in Tamil Nadu. The Gundlapalle ferrosyenite pluton, occurs as four mounds which are not well exposed and is located towards northern side of the Cuddapah basin. The Gokanakonda ferrosyenites are hosted by Settupalle alkaline complex and the ferrosyenite of Uppalapadu is located in the Uppalapadu alkaline complex. The Settupalle and Uppalapadu complexes are conspicuously confined to the junction zone between two contrasting major rock formations and between two fold belts i.e. the Dharwar (granite-greenstone) belt towards the west and the Eastern Ghat (gneiss-granulite) mobile belt towards the east (Leelanandam, 1989). The ferrosyenites are mainly composed of K-rich alkalifeldspars, ferromanesian minerals (Fayalite & Fe-clinopyroxenes) and hornblende, biotite, apatite, zircon and sphene as minor phase.

Tectonically, the ferrosyenites of Gokanakonda and Uppalapadu occur along the rift zones and ferrosyenite of Gundlapalle occur along the deep fault zone at the northern pinch of the Cuddapah basin. Geochemically, these ferrosyenites are enriched in FeO content and depleted in MgO due to the presence of ferromagnesian minerals. The normative quartz and hypersthene in these rocks elucidate their sub-alkaline character. These ferrosyenites are enriched in LILE and depleted in HFSE content. The conspicuous presence of Fe-rich pyroxene and the absence of hydrous mafic minerals infer that the ferrosyenite magma is of anhydrous character and crystallized under reducing low fO_2 condition.