

Significance of Fayalite-Quartz assemblage in Gokanakonda Fayalite syenite complex, Cuddapah Alkaline Province, Andra Pradesh, South India

SRINIVASAN T.P¹.

¹Head, Department of Geology, Bhavans New Science College,
Narayanaguda, Hyderabad-500 029, Andhra Pradesh, South
India.

The Dharwar craton (DC) in the Southern Indian Peninsula is unique in possessing a major repository of rare

Intrusives comprising kimberlites, lamproites and fayalite syenites in the entire Indian subcontinent. The fayalite syenite was first reported from Sivamalai, Tamilnadu, South India is from the Southern Granulite Terrane (SGT) where it seemingly comprising a part of an alkaline suite containing syenitic variants (nepheline syenite, quartz syenite, hornblende/biotite syenite, fayalite-pyroxene syenite and fayalite-quartz syenite etc.) with insignificant mafic alkaline rocks. In addition to Sivamalai, more fayalite syenite bodies have come to be noticed at Errakonda and Gokanakonda – lies close to the neighbouring coastal granulite terrane (CGT) and to the east of the intracratonic Cuddapah basin (ICCB). It is conspicuously confined to an extremely narrow linear belt which is close to known basement fracture zone, with which the major bouguer gravity axis is parallel in NNE-SSW direction. This belt lies at the junction zone between two fold belts i.e. the Dharwar belt towards the west and Eastern ghat belt towards east.

The Gokanakonda Fayalite syenite closely associated with hornblende syenite. Gabbros of tholeiitic composition are also seen in close spatial association with fayalite syenites. The Gokanakonda and other Indian fayalite syenites have the following mineralogical assemblages.

- a. Fayalite + CPX + horn blende + biotite + alkali feldspar + plagioclase
- b. Fayalite + quartz + opaques + alkalifeldspar + plagioclase

The significant aspect of the Gokanakonda fayalite syenites is the presence of quartz which is rare and unique in the Cuddapah alkaline Province. It is not clear whether the Gokanakonda syenites have also subjected to metamorphism. There is a unanimity regarding the igneous origin of all the ferrosyenites. No relationship could be established to show that the ferrosyenites are the differentiated products of an alkaline magma. That the ferrosyenites had an origin independent of alkaline magmatism has been confirmed recently. A relatively dry syenitic fraction, possibly derived from a tholeiitic gabbro magma and its crystallization under low oxygen fugacity condition was responsible for the occurrence of fayalite (and fayalite-free) ferrosyenites at Sivamalai, Errakonda and Gokanakonda. The magmatic episodes at SGT and CGT, which resulted in the emplacement of fayalite syenites in these parts were widely separated by time, with the magmatism at Errakonda (and possibly at Gokanakonda) taking place during the mid-proterozoic time and another at Sivamalai during the Pan-African time.