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Mineralogical Characterisation of Anhydrite from Charnockites: Evidence for Precambrian Saline Brine Influx in Madurai Block, Southern India

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Abstract

The western Madurai Block is mostly composed of granulite facies metamorphic rocks – Charnockite ± garnet, hornblende-biotite gneiss, biotite gneiss, cordierite gneiss, and quartzo-feldspathic gneiss. Along with these rock types there are several Pan-African alkaline intrusive, which preserves a cross cutting relationship with host granulites. The present study is mainly focused on the mineralisation of anhydrite from charnockites. The occurrence of anhydrite within charnockites is rare and has not reported elsewhere. Anhydrite is found as patches within charnockite not along any specified plain. This may be due to hydrothermal fluid influx later into the charnockite body. Anhydrite is found in association with gypsum and calcite. Pyroxenes are found retrogressed to hornblende in association with the anhydrite mineralisation. The mineral anhydrite is confirmed and reconfirmed by hyper spectral analysis and Raman spectroscopy. Fluid inclusion studies reveal the presence of primary and secondary inclusions. The genesis of anhydrite can be inferred as precipitation from saline hydrothermal activity occurred post to the charnockitisation.

Keywords: Anhydrite, Charnockite, Madurai Block, Raman Spectroscopy, Fluid inclusion.
