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Micromorphology, Geochemistry and Spatial Evaluation of Calcrete Deposits in and around Sathankulam, Tuticorin District, Tamilnadu, India

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Abstract

Calcrete has been formed as a widespread deposits having sub aerial exposures with thick profile in the regolith part of Sathankulam region (Latitude 08º 23′: 08º 30′ N and Longitude 77º 51′: 77º 59′ E), Tuticorin district of Tamilnadu, India. The spatial collection of calcrete samples from various outcrops reveals that the calcrete occurs as gravel, nodular, hardpan, oolitic, massive or laminated and chalky forms. The micromorphological study reveals that carbonate precipitation was in the form of micritic and sparitic calcite, which show colloform, peloidal, lensoidal, veining and void lining/rimming with unaltered clasts of quartz, feldspar, hornblende, biotite and hypersthene, sesquioxide impregnation with calcified algal mats and calcified fungal hypae preservation. The analytical results of major element of calcrete indicates that CaO, MgO, SiO_2, Al_2O_3, Fe_2O_3 andtotal carbonate content (TCO_3) have elevated concentration of >1% than the other oxides such as MnO, TiO_2, Na_2O, K_2O and P_2O_5. The GIS based thematic iso-elemental contour maps gives the spatial analysis of major element distribution in the study area. The depositional environment of the study area is worked out from the geochemical characteristics of calcrete deposit.

Keywords: Micromorphology, Regolith, Sathankulam, Clasts, Spatial analysis, GIS