Mineralogical, Geochemical and Genesis of Complex Ferricrete-Silcrete association in Lateritic profile from NW Bengal Basin; Eastern India

JYOTIBALA SINGH[1], SOURAV MUKHOPADHYAY[2], S. J. SANGODE[1*], ANUP DHOBALE[3], S. N. RAJAGURU[2]

[1]Department of Geology; S.P. Pune University, Pune, India (*Corresponding author: sangode@unipune.ac.in)

[2]Deccan College Post-graduate Research Institute; Pune, India (souravgeo.mukherjee@gmail.com)

[3]Department of Geology; R. T. M Nagpur University; Nagpur, India

Bengal Basin is the type area for laterites, and a substantial portion of it is occupied by lateritic cover of varying thickness, developed over rocks of different composition and age. The detrital laterites are occurred here in loose concretions as gravels and pebbles and these are generally derived from weathered primary Upland laterites by fluvial processes and are deposited far from their source of origin (Rajmahal Trap). In this present study a ~5.2 m thick lateritic profile in Birbhum district of West Bengal (India) result shows antiferromagnetic mineralogy with very high coercivities (>500 mT) depicting association of hematite and goethite. The ore microscopy and XRD spectroscopy show unique paragenetic association of limonite, hematite, goethite, gibbsite and kaolinite. Ore microscopy indicates formation of hematite and goethite as the earliest episode followed by remobilization of iron oxides as limonitic matrix and fillings. This accommodates a significant episode of silcretization during the later phases and probably before the final episode of limonitization. The primary laterite is capped with lateritic soils that can be sharply demarcated by mineral magnetic changes. The study infers that the laterite experienced a warm phase followed by warm humid and intense humid phases greatly influenced by the monsoonal conditions in the Bay of Bengal.