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# Hematite and Goethite from Duricrusts Developed by Lateritic Chemical Weathering of Precambrian Banded Iron Formations, Minas Gerais, Brazil

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**Abstract:** The upper 15– 20 m of a 200 m thick lateritic weathering profile on Precambrian itabirites of Capanema, Brazil, reveals a genetic pathway for the formation of hematitic and goethitic nodules in the ferruginous crust through a very fine grain Al-hematite and Al-goethite mixture, called here the brick-red-material (brm). This evolution develops between the soft saprolite and a 10 m thick indurated ferruginous crust. The soft saprolite retains the original structures of the itabirite and is characterized by almost complete dissolution of quartz, the development of goethite septa, and the partial dissolution of primary hematite. Near the contact with the overlying ferruginous crust, the brm is gradually filling voids as well as replacing primary hematite and goethite in the saprolite. In the upper indurated crust, the brm transforms into coarse structureless ferruginous nodules (aluminous hematites and goethites) and is the precursor of the hematite-goethitic nodules of the crusts. Crystallization of newly-formed Al-goethite and Al-hematite within the brm occurs without detectable amounts of amorphous iron oxides of ferrihydrite precursors.

**Key Words:** Hematite • Goethite • Laterite • Mössbauer Spectrometry

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