

ORIGIN OF THE IRON ORES IN THE ITABIRA DISTRICT

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The Itabira District, in the Iron Quadrangle, Southern Brazil, hosts one of the largest iron deposits of the world. The iron ores are represented by weathering-enriched itabirites (metamorphic banded iron formations), high-grade ores (called Hematites) and a subordinate ferricrust (canga). The former was originated by quartz leaching and residual iron-oxide enrichment from hard-itabirites during post-metamorphic weathering process. That process, which turns itabirites into a crumbly material, mineable at low cost, can reach great depth (more than 300 m below surface) and was guided by supergenetic water flow. The intensity of leaching is related not only to near-surface rock position but also to tectonic structures. The iron grades averages around 50 % but can reach up to 60 % in more leached itabirites. The high-grade hematite ore bodies, varying from 10 cm to 300 m of thickness, have 66 % iron in average. They can be followed to great depths, sometimes associated with low-grade, hard, itabirites. The origin of these ores is controversial but some good new evidence show that some of the bodies were formed by structurally controlled deposition of iron, during a tectonic-metamorphic event. Canga, a hydrated ore, represents a minor ore mine product. It occurs forming a cap over the iron formations or filling palaeo-valleys. It can have high iron grades but, also, high deleterious element contents, limiting economic recovery.