

Genesis of High-grade large iron ore bodies of Orissa and Bihar, India.

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In the iron ore district of Orissa and Bihar States in India numerous highgrade (+60 % Fe) essentially hematite ore-deposits occur associated with the stratigraphically youngest Precambrian BIF sequence (BIF-3).

Known as the 'horse-shoe' because of the broad 'U' shaped nature of the BIF outcrop, this mother rock of iron ore maintains a rough 35-40% of ore minerals in its bands where as the ore bodies stratigraphically below synchronous or above are of higher grade. Quite large in size the largest single deposit is roughly estimated to have about 2400 mt of ore. Deposits with a minimum of 500 mt are plenty where the cut-off grade can at best be brought down to 58% fe. The ore bodies are mostly synsedimentary except those where weathering and consequent leaching has produced laminated enriched ore bodies mostly towards the top of the exposed BIF areas.

Based on the evidences the ore bodies are found to have been formed by synsedimentary including syn-sedimentary brecciation and mineralisation and biogenesis) diagenesis (early to late) and volcanic - exhalation and post-diagenetic mineralisation. Epigenetic processes (oxidation and supergene enrichment weathering and lateritisation) have played their roles in upgrading the size, shape and tenor of the ore bodies.

Usually more than one processes combinedly are found to be responsible for the origin of bulk of the ore bodies although depending on the multi-parametric situation of it in space and time. One or two processes play important role for the genesis where as other processes act only peripherally. Case histories of a few deposits have been considered & discussed.