

On The Occurrence Of The Brazilian Xenotime - Mineralogy

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The only known deposit of xenotime [(Y, REE) PO₄] in Brazil is located in Pitinga Mine (Amazon State) Paranapanema Group. The mineralization is genetically related with granite, the ore is cassiterite with zircon, ilmenite, columbite-tantalite, pyrochlore and xenotime, with strong Hf, REE, Pb and Bi. Rich alluvial fan concentration of these minerals are near their source rocks.

Studies carried out in the Pitinga concentration pilot plant produced cassiterite (60-70% Sn), zircon (40% Zr), xenotime (20% Y), tantalite-columbite (40% Nb₂O₅ – 4% Ta₂O₅) and a middling containing 90% xenotime and 10% zircon.

There is a lack of information about the Brazilian xenotime resource and its associated minerals. The aim of this paper is to present a detailed mineralogical characterization of xenotime and zircon too using optical polarized microscopy, X- ray diffraction (XRD) and SEM/EDS techniques.

The Pitinga xenotime has higher contents of heavy rare earth oxides (32.42 wt % of Y₂O₃, Er₂O₃, and Dy₂O₃) and thorium (0.33% ThO₂) and lower contents of Yttrium (23.03 wt %) than other deposits in the world. Zircon (56.45% ZrO₂, and 2.96% HfO₂, thorium(1.48% ThO₂) and iron (1.05%).

Xenotime carries microinclusions of thorite (ThSiO₄) in the size range 1 to 5 μ m and a pronounced zoning and contents of REE, which are only seen in backscattering electron images (BSE). Zircon has significant amount of thorite and some iron staining.