

Uranium and REE recovery from acid mine drainage treatment waste –Caldas/BR case

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The Caldas uranium mine and mill was the first uranium producer site in Brazil. It has ceased its operations since 1995 and now it's under decommissioning process. One of the main issues to be dealt with is the acid water produced in some of the waste rock deposits due to the nature of the ore.

As it is very known, the presence of sulfide containing minerals in the ore may promote the occurring of acid mine drainage (AMD), one of the main problems regarding environmental impacts of mining activities. To prevent contamination of the local watersheds, it is usual to treat the acid water produced with lime, to precipitate the soluble metals, and then store the solid produced in a safe way.

This work aims to assess the uranium and rare earths recovery in the solid material produced at the Caldas site. It contains about 0,25% U₃O₈ and 2,5% RE₂O₃. The hydrometallurgical process being developed comprises leaching, solvent extraction and precipitation steps. Preliminary results of the acid leaching tests point to 96% and 90% recovery of U₃O₈ and RE₂O₃, respectively. The isotherm for uranium extraction shows a recovery of 99,7% of this element.

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