

The Amazonic Bauxite: Advantages and Challenges

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Abstract

The Amazon rainforest has some of the largest known bauxite deposits in the planet, generally characterized by a thicker layer of overburden material and a thinner layer of bauxite. The significant costs associated with the sustainable exploration of these mineral resources determine that the economic value gained is largely dependent on how much we understand their intrinsic advantages, relative to other existing bauxite ores, as well as the challenges associated with mining, beneficiation and refining.

Firstly, the low level of impurities allows stressing the yield close to its practical limit, maximizing the output and minimizing the energy usage of the alumina refining process.

Secondly, the high gibbsitic alumina available equates to a lower intensity of residue generation, thus reducing both capital and operational costs for residue handling and storage at the refinery.

However, a major challenge posed by the Amazonic bauxites is their relatively high clay content (namely kaolinite), which leads to an increased consumption of caustic soda. There is good documentation of the mixed history of attempts to minimize this negative effect of kaolinite. Would an improved understanding of the relevant scientific fundamentals, coupled with utilization of state-of-the-art technologies, be able to create an efficient solution to this problem?

Keywords: Amazonic bauxite; gibbsitic alumina; kaolinite; caustic soda consumption.