Lime Use Alternatives and Impacts on Processing Boehmitic Bauxites

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Abstract

ETI Aluminyum A.S has its own bauxite mines, and has been extracting from two mines out of five to feed its alumina refinery since the 1970's. The refinery was designed to process boehmitic bauxite with a reasonable A/S (Al_2O_3/SiO_2, w/w) ratio of 8.2. Over the years, bauxite quality has decreased and current reserves show an average A/S ratio of 7.0. On the other hand, the characterization studies for the other three mines, which ETI will exploit in a few years, indicate that diaspore and goethite content of these bauxite are significantly higher than current ones. In these circumstances, ETI needs to prepare for bauxite quality changes which can adversely affect operating cost and product quality. The first and most interesting option for examination is lime utilisation, and ETI has focused on studying lime addition in laboratory and plant trials. In the study discussed in this paper, the impacts of lime addition on boehmite/diaspore solubility, goethite conversion, titanium behavior, caustic soda consumption, as well as red mud settling properties and product quality, have been investigated. It has been observed that both the lime dosing point and quantity play an important role on desired process result.

Keywords: Boehmitic Bauxite; Soda Consumption; Lime Addition; Digestion.