The LCL&L process: A sustainable Solution for the Treatment and Recycling of Spent Potlining.

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Abstract

Spent potlining (SPL) is a hazardous waste produced by aluminum smelters. SPL is generated from the internal lining of aluminum electrolysis cells, constituted of carbon and refractory bricks and replaced after five to eight years in service. It is classified as a hazardous waste because of its contamination with fluorides and cyanides and its reactivity with water, generating explosive gases. Nowadays, the aluminum industry has made some progress with the SPL issue by recognizing that landfilling is no longer acceptable by most local communities. In 2008, Rio Tinto Alcan inaugurated a new plant in Jonquière (Québec) for the treatment of 80 kt of SPL annually, based on the low-caustic leaching and liming process (LCL&L) developed at Arvida Research and Development Centre in the early 1990's. This paper describes LCL&L process, including valorization routes for its by-products and some technological challenges faced during the ramp-up of the plant to its nominal capacity.

Keywords: Spent potlining; LCL&L process; LCL&L by-product valorization.