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Optimization study of the yield of ore comminution by electrical discharge

Context

A deposit is a natural body that contains a more or less complex set of rocks and minerals. Its exploitation makes it possible to extract a set of ores which are not all recoverable and which require a separation stage to keep only the useful part. Comminution is the first stage of mineralurgical treatment which leads to a particle size reduction. The objective is to achieve a target particle size called the "release mesh" ideal for releasing valuable minerals, generating fresh grain surfaces and reducing grain size to improve hydrometallurgical or pyrometallurgical transformation rates.

This thesis work aims to convey the interest of electric fracturing on ore comminution. To do this, two methods can be used.

The indirect method is based on the generation of a shock wave in the fluid present around the ore. The technique consists of initiating an electric arc (plasma channel), of high peak power, between two immersed electrodes (sparker).

The direct method consists of perforating the submerged rock by passing the electric arc through the submerged solid.

