ALTERNATIVE DEPRESSOR FOR APATITE FLOTATION

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The reality of the phosphate mines in the world has been changing. The reserves content has reduced over the years. As a consequence of this reduction, contaminants such as iron, silica and magnesium contained in phosphate rock concentrate are affecting the stability of the chemical plants, which compromises the rate of phosphate utilization and the quality of the products produced. In order to obtain a concentrate of phosphatic rocks of market acceptable quality (35% P2O5), the flotation process is the most suitable method for processing this. The present study aims to evaluate the potential of replacing corn starch as a depressant in the flotation step. Corn starch is the most commonly used depressant because of its availability, or even lack of studies on the efficiency of other depressants. Microflotation tests were carried out in modified Hallimond tubes with the concentration of the Clariant Flotigam 5806 collector at 5.0 mg / L and the corn starch depressant used in industries, cassava starch and cassava flour at dosages of 0, 400, 800, 1,600, 3,200, 4,800 and 6,400 g / t at pH 8, the depressors were evaluated in overdoses with the objective of analyzing depression stagnation or continuity of the same according to increase of the dosage. The air flow used for the tests was 40 cm³s⁻¹ and a pressure of 10 psi, which provides less hydraulic drag. 1 g of apatite mineral was used in the granulometry of -100 + 150 #. The characterization of the starches and the sample of the apatite mineral were made by scanning electron microscopy SEM, EDS, fluorescence and X-ray diffraction, as well as their zeta potential. The results of the characterization showed that the sample of the mineral has high purity, showing absence of mixed particles. The results below (Figure 1) indicate that corn starch depressor presents a better recovery compared to cassava starch and cassava flour. Cassava starch requires a dosage two times higher than corn starch to achieve the same depression of the apatite mineral. Flotation tests showed can propitiate a better understanding of the dosages of starches and flour used.

![Figure 1 - Apatite recovery for different dosages of depressants](image-url)