

Title of abstract (use 'Title' style)

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EVALUATION OF THE PROCESSING ROUTES OF LITHIUM FROM THE EUROPEAN PEGMATITE DEPOSITS.

Pegmatite deposits have been exploited in Europe mainly for quartz and feldspar. They also contain strategic metals such as lithium, niobium, tantalum, and Rare Earth Elements as minor components. The supply of some of these elements i.e. Li and Ta is of concern, therefore, it is very important to investigate recovery of such metals from pegmatite ores.

The samples from two european deposits were investigated as sources of « hard Li ». The main Li-bearing mineral was lepidolite for the pegmatite ore sample from Goncalo deposits (Portugal), while the spodumene recovery was evaluated from the LCT pegmatite from Lantta deposit (Finlande).

The processing routes developed combine the physical separation (electrostatic and/or gravity methods) and the flotation. A separation between lepidolite and muscovite was achieved, allowing to obtain a Li pre-concentrate assaying 3.5 % Li₂O from a feed grade containing 1.8 % Li₂O.

As expected from zeta potential measurements, the flotation testwork performed with the fine size fraction (-210+63 µm), showed that the lepidolite flotation is optimized between pH 3 and 5, where concentrates assaying 4.2-4.5 % Li₂O corresponding to 87-95% Li recovery were attained at the rougher stage. At pH > 5, selectivity decreases and SiO₂ analysis suggest flotation of quartz and other silicate rather than lepidolite. This paper focuses on the flotation of spodumene from the LCT pegmatite according to the size fraction. Activation of spodumene by calcium ions makes the surface charge less negative due to the adsorption of Ca²⁺ on the surface and promote the collector adsorption. HF-free feldspar/quartz flotation was also tested using the rejects of spodumene flotation to promote the separation of feldspars from quartz, in order to obtain products for ceramic application.

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