

# **A comparison of electrodynamic fragmentation to cone crushing of some lithium bearing pegmatites to liberate Li bearing minerals**

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## **ABSTRACT**

The use of electrodynamic fragmentation (electrical pulse disaggregation, high voltage pulse disaggregation) process as an alternative to conventional cone crushing technique to enhance mineral liberation properties was tested on pegmatites from three deposits in Western Australia with different textures and compositions. Subsamples of a spodumene and three different micaceous pegmatites were subjected to the comminution processes separately and screened to pass a particle size of 4mm.

Despite the difference in mineral composition and textures for the different samples, the different comminution methods did not appear to markedly influence the mineral distributions within the different size fractions when processed separately and screened to pass a fixed 4mm screen. Specific segregation of some minerals such as quartz to fine fractions observed in some samples were not related to the comminution technique in this test work.

The theoretical grade to recovery curves for both spodumene and micaceous deposits were generally similar by both comminution techniques, with Li mineral recoveries expected between 80 and 90%. Separation of quartz, feldspars and muscovite observed associated with ~20% of Li bearing minerals in the coarse fractions will require further particle size reduction.

A second series of tests examined a range of specific energy conditions by electrodynamic fragmentation comminution to reduce the amount of energy required to liberate minerals of interest. Comparison of the two comminution techniques at similar specific energy levels revealed electrodynamic fragmentation yielded coarser products with significantly less fines than the cone crushing.

*Keywords: Lithium, Li-bearing ores, comminution, LCT pegmatite, TIMA, mineral liberation*