

Quantification of Lithium and Mineralogical Mapping in Crushed Ore Samples Using ECORE

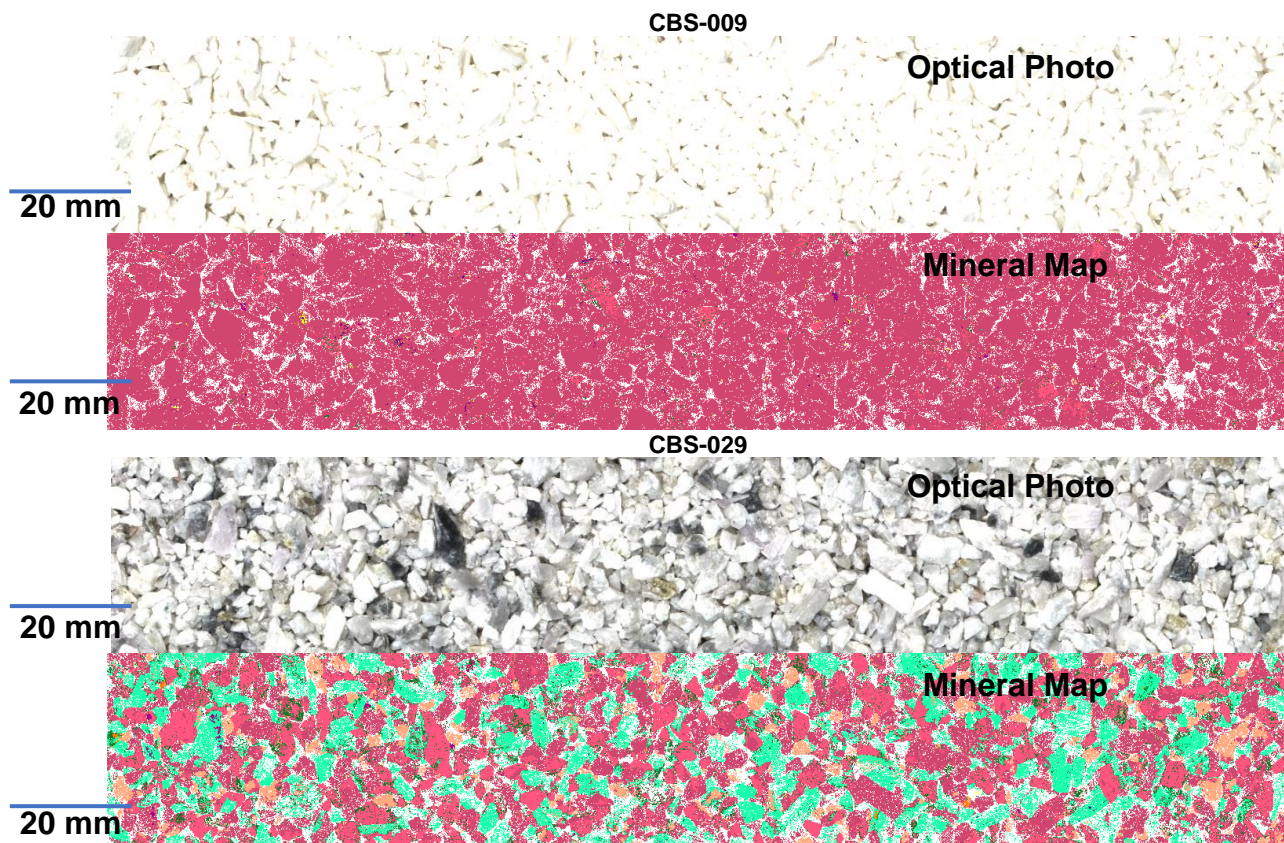
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ABSTRACT

This paper reports on the quantification of lithium and mineralogical mapping in crushed lithium ore by laser-induced breakdown spectroscopy (LIBS) using two different calibration methods on the ECORE. Thirty crushed ore samples from pegmatite lithium deposit were used in this study. Representative samples containing the abundant minerals were taken from these crushed ores and mixed with resin to make polished disks. These disks were first analysed by TIMA (TESCAN Integrated Mineral Analyzer) and then by LIBS ECORE analyser to determine the minerals. Afterwards, each of the thirty crushed ore samples (<10 mm) was poured into rectangular containers and analysed by the ECORE analyser, then mineral mapping was produced on the scanned surfaces using the mineral library established on the polished sections. The optical photo and the minerals maps obtained are presented in Figure 1 for four different samples. For the first method the lithium concentrations were inferred from the empirical mineral chemistry formula whereas the second one consisted in building a conventional calibration curve with the crushed material and then use it to predict the lithium concentration in unknown crushed materials. This paper reports an ultra-fast and inexpensive automated method of instrumental analysis that will accelerate decision-making in lithium exploration, and its exploitation directly on crushed ore or drill cuttings.



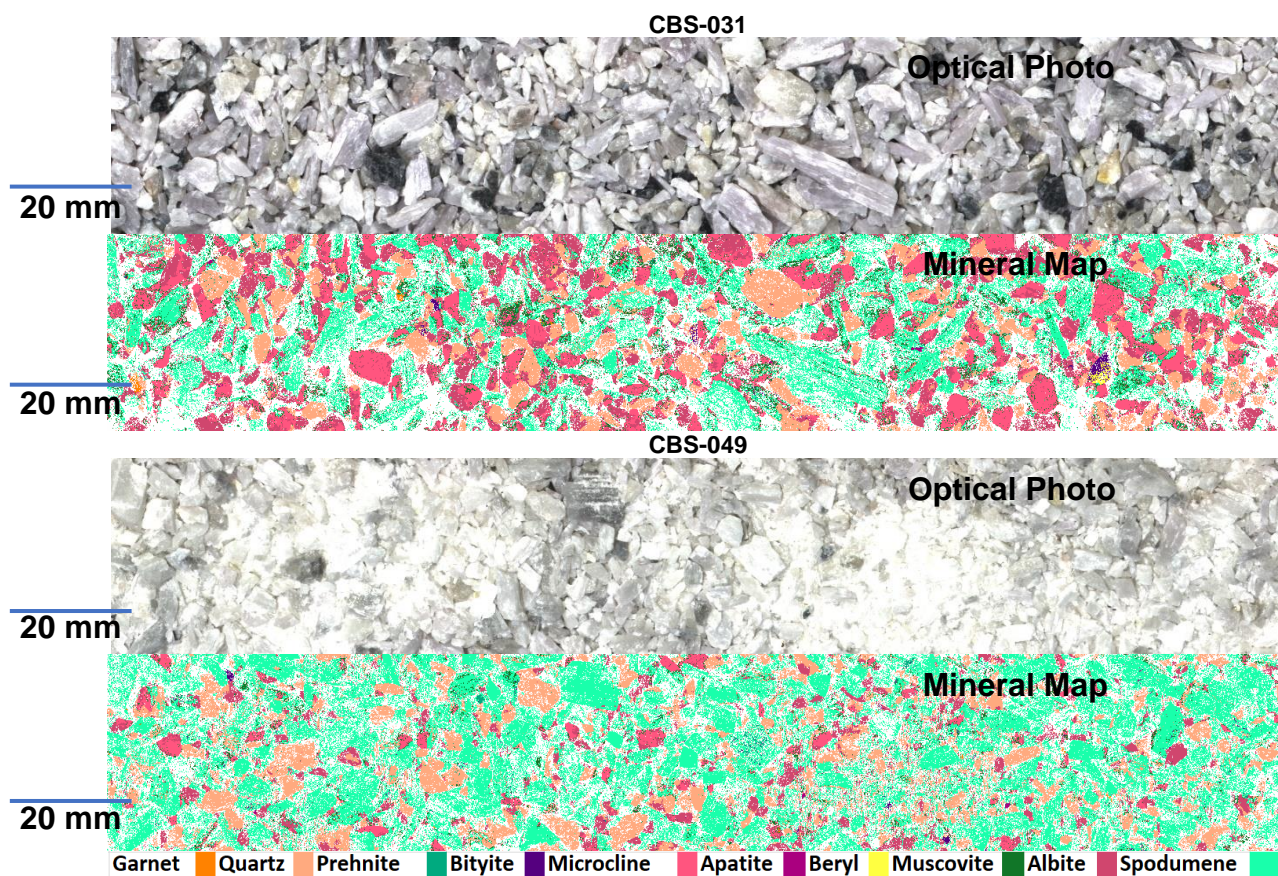


Figure 1. Optical photos (top) of eight representative crushed ore sample split in the above-described containers and ECORE mineral maps (bottom)