



Direct Measurement of Lithium in the Field Using SciAps Z300 Hand Held LIBS

Introduction

The capability to conduct in field, direct measurement of lithium [Li z=3] is now a reality. Using SciAps hand held Z300 LIBS analyzer, Lithium Australia NL (LIT), an Australian based, ASX listed Lithium explorer and vertically integrated lithium processing technology developer, conducted real time measurement of lithium during exploration drilling at the Agua Fria prospect in Sonora, Mexico. This case study presented here reports some of the data generated during this campaign and demonstrates that the SciAps hand held Z300 is a fit for purpose tool for the direct measurement of Li under real field conditions.

The recent surge in demand for lithium, has seen a rapid increase in exploration for and development of lithium projects worldwide. Although there have been cases where fpXRF have been successfully utilized to test associated elements and assist with lithium exploration in the case of Li-Pegmatites the direct measurement of Li is not possible using fpXRF. Hand held Laser Induced Breakdown Spectroscopy or LIBS analyzers allow measurement of light elements as well as many other elements typically analyzed with conventionally used techniques such as fpXRF. This presents opportunities for the development for new applications such as the in-field analysis of geochemically and economically important elements such as Li, B, Be, C and Na.

Data and Discussion

A SciAps Z300 field-portable LIBS analyzer was used for sampling control during drilling. The field-portable analyzer was calibrated for lithium against samples with lab assays from various clay samples from the Agua Fria prospect collected during earlier trenching and sampling. Sample pellets were pressed using a portable REFLEX press. Three Z-300 LIBS readings were averaged for each pressed sample pellet. Readings took in the order of 3 seconds each consisted of a raster pattern testing 12 locations and averaged to a single value. As with the effective use of any analytical technique good sample handling procedures, appropriate testing methodology and quality control are essential for success.



Fig. 1. Sample pelletizing using a Reflex Press and sample analyses using SciAps Z300 field-portable LIBS analyzer.

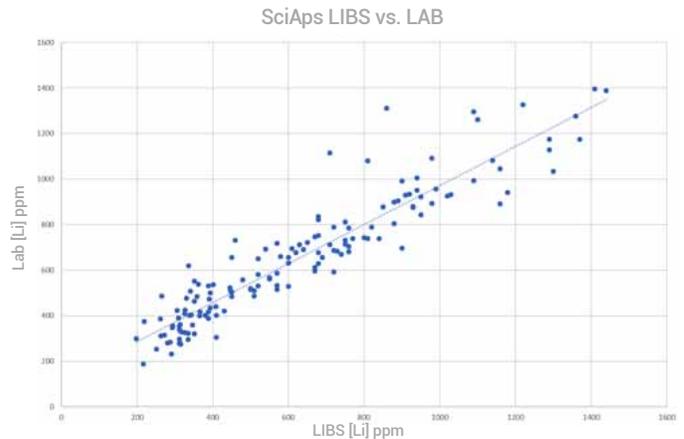


Fig. 2. Comparison of Li ppm between laboratory and hand-held LIBS $R^2 = 0.8722$ $n=148$ over 4 drill holes. Data courtesy of Lithium Australia NL.

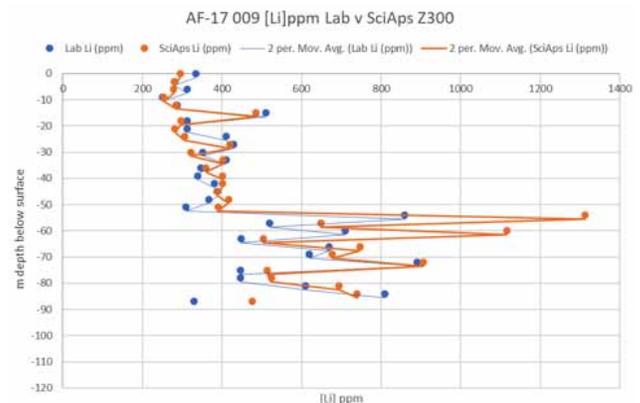


Fig. 3. Comparison of Li ppm between laboratory and hand-held LIBS downhole on AF-17 009. Data courtesy of Lithium Australia NL.