

Automated LIBS Analysis for the Factory Floor

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An automated version of Applied Spectra Inc.'s J200 LIBS system has been developed which can be used by factory shift workers or technicians with no experience performing LIBS analysis or quantitative chemistry. The modified Axiom software platform prompts the technician at every step of the data collection process, i.e., loading the samples, ensuring they are in focus, placing pre-loaded experimental methods in the proper locations, and saving the data. The data saved by the technician is processed by an automated version of the Clarity data analysis software. This automated software can create calibration curves, process unknowns for quantitative treatment, and export data in the form of a tab-delimited text file. Qualitative data may also be exported in the form of depth profiles and map figures. The Clarity software platform can be programmed to perform traditional univariate calibration via integration of predetermined elemental emission lines or to perform multivariate calibration via historical data libraries.

The software can also be programmed to upload results to a database automatically. This technology allows a sophisticated chemical analysis to be performed by shift workers in a factory setting without supervision.

Here a case study is presented where these advances are put to the test of fast analysis of solid samples with full automation of the data collection, reduction (based on a combination of univariate and multivariate methods) and reporting that allows for quick decision making in material production.