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**Multivariate calibration for multi-elemental analysis  
of solid glass samples using Laser-Induced Breakdown Spectroscopy.**

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Laser-Induced Breakdown Spectroscopy (LIBS) has been applied for multi-elemental analysis of solidified melt samples containing several analytes with high concentrations (Al, Fe, Mg, Ca, Ti and Si). In order to take into account the matrix effects, a non-linear multivariate approach was used to establish a calibration model for all these elements. We discuss here about the mathematical aspects of the multivariate approach itself and present results obtained for a specific LIBS application. In particular, after establishing a calibration with several samples, we provide a prediction of unknown test samples that appear to be in good agreement with XRF measurements. The various results that will be presented show that the combination of LIBS and a multivariate model present a great potential for quantitative analysis of major and minor elements in matrices, in particular, where minor elements are in the percent range which is the case of slag, glass and mineral ore.