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Matrix Effects on Boron Containing Materials due to Laser Ablation Molecular Isotopic Spectrometry (LAMIS)[1] STACI R. BROWN, CHARLEMAGNE A. AKPOVO, JORGE MARTINEZ, Department of Physics, Florida A&M University, ALAN FORD, Alakai Defense Systems, KENLEY HERBERT, Department of Chemistry, Florida A&M University , LEWIS JOHNSON, Department of Physics, Florida A&M University — Laser Induced Breakdown Spectroscopy (LIBS) is a spectroscopic technique that is used for the qualitative and quantitative analysis of materials in the liquid, solid, or gas phase. LIBS can also be used for the detection of isotopic shifts in atomic and diatomic species via Laser-Ablation Molecular Isotopic Spectroscopy (LAMIS). However, any additional elements that are entrained into the plasma other than the element of interest, can affect the extent of ablation and quality of spectra and hence, potentially obscure or aid in the relative abundance assessment for a given element. To address the importance of matrix effects, the isotopic analysis of boron obtained from boron oxide (BO) emission originating from different boron-containing compounds, such as boron nitride (BN), boric acid (H_3BO_3), and borax ($Na_2B_4O_7 \bullet 10H_2O$), via LIBS has been performed here. Each of these materials has different physical properties and elemental composition in order to illustrate possible challenges for the LAMIS method. A calibration-free model similar to that for the original LAMIS work is used to determine properties of the plasma as the matrix is changed.

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