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THE EFFECT OF ACIDS ON PIG BONE ESTIMATED BY LIBS

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Abstract. The effect of sulfuric, hydrochloric, hydrofluoric and acetic acid on pig shoulder bone was investigated by LIBS (Laser-Induced Breakdown Spectroscopy). LIBS is a valuable tool in forensic science for the analysis of pig bones, which are often used as analogs for human bones in forensic anthropological studies and can be subjected to various experimental conditions to simulate forensic scenarios. In practice, forensic scientists often encounter the destruction of evidence by mineral acids. The ratio of Ca II (364.441 nm) to Ca I (370.603 nm) lines in LIBS spectra is used to obtain information about bone hardness, which is influenced by its mineral content and density (see Fig. 1). Selected lines are much less susceptible to self-absorption than resonant lines. Acids significantly affect the hardness and structural integrity of pig shoulder bone by dissolving mineral components, especially hydroxyapatite, and degrading organic matrices such as collagen.

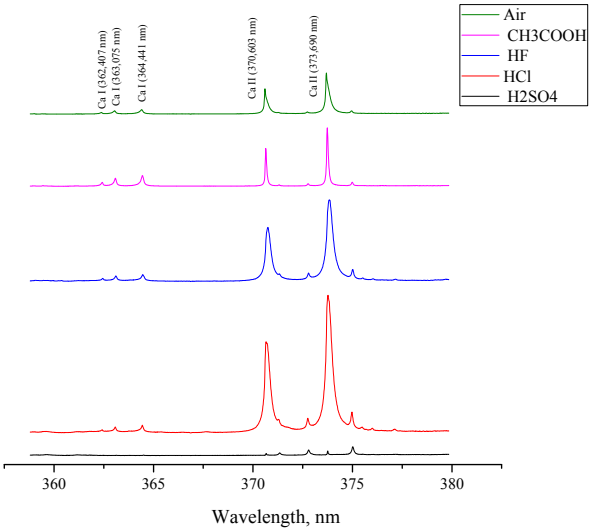

Figure 1: LIBS spectra of pig shoulder bone in 0.1 M solutions of acids

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