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Laser-Induced Breakdown Spectroscopy (LIBS): Past, Present and Future

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The laser-induced breakdown spectroscopy (LIBS) technique is based on the spectroscopic analysis of light emission from the plasma generated by focusing a powerful laser beam on a target. LIBS is being used as an analytical method by a growing number of research groups. The growing interest in LIBS, particularly in the last decade, has led to an increasing number of publications on its applications, both in the laboratory and in industry. Recent developments in technology and research in spectroscopic detectors have suggested a promising future and an improvement of measurements in plasma spectroscopy. Undoubtedly, the advent of high quality solid-state detectors is revolutionizing the field of atomic spectroscopy. New optical technologies, when coupled with these new generations of detectors, provide powerful tools for plasma diagnostics and spectrochemical analysis [1,2]. An important advantage of the LIBS technique over classical methods stems from the possibility of in-situ analysis of virtually all types of materials (solids, liquids, molten materials, and gases) without the need for any sample preparation. In this presentation, we will give an overview on the development of the LIBS technique in the past, present and some perspectives for its future as analytical tool. Also, we will cover fundamental studies, analytical results and applications of LIBS related to the field of analytical chemistry, real time analysis and process control.

References:

- [1] A.W. Miziolek, V. Palleschi, I. Schechter (Eds), Laser Induced Breakdown Spectroscopy, Cambridge University Press, 2006.
- [2] L. Radziemski, D. Cremers, Handbook of Laser Induced Breakdown Spectroscopy, Wiley, 2006.