



Laser Ablation – ICPMS: A Tool for Multielement Microanalysis of Solid Samples

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Abstract: Laser ablation – ICPMS is a multielement, microanalytical technique that has developed rapidly since its inception by Gray in 1985.¹ Its multidisciplinary character follows from applications in various fields such as biology, medicine, geology, archaeology, forensics, materials science, etc. Initially a tool for probing the bulk element concentrations of multifarious solid samples (biological tissues, alloys, plastics, glasses, etc.) via drilling or line scanning actions, it has become a very powerful technique to assess the surface (2-dimensional) and volume (3-dimensional) element distribution. During the last five years, instrumental improvements to the laser ablation cell and its interface with the ICPMS have led to 25-100 times faster surface and volume mapping times, making high resolution scans in reasonable mapping times (hours) possible.² With the latest generation of laser ablation – ICPMS instruments one can obtain better than 5x5 μm^2 pixel resolution with a detection limit on the $\mu\text{g kg}^{-1}$ level for most elements of the periodic table. This presentation will focus on the fundamentals of the laser ablation – ICPMS technique, the development of the technique, its latest incarnation, and examples of multidisciplinary applications.

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1. Gray, *Analyst*, 1985, 110, 551.
 2. Van Malderen et al., *J. Anal. At. Spectrom*, 2016, 31, 423.
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