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14as JORNADAS DE ANÁLISIS INSTRUMENTAL (JAI)

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Title	Characterization of Laser-Induced Plasmas Of Organic Compounds by spatially- and temporally resolved optical emission spectrometry
Topic(s)	Other fields within analytical chemistry and instrumental analysis
Authors	Marina López Claros, Pablo Purhoit, José M. Vadillo, J. Javier Laserna

Summary

The large majority of laser-induced plasmas experiments are performed on metals in air at atmospheric pressure, where recombination mechanisms do not play a significant role, as the primary emission lines of interest are significantly more intense than those derived from recombination with air, particularly those yielding oxides. Due to the large number of electronic transitions commonly attainable on metals, many intense emission lines are recorded and different regions of interest useful for identification and quantification purposes may be assigned.

The main difficulties in the interpretation of the molecular emission of species containing C, N, O or H relies on the questions concerning their origin: direct release from native bonds or recombination with ambient constituents. In other words: does the resultant spectrum mimic the structure of a molecule or the molecular information gets lost in the course of the secondary reactions? Considering that the spectrum observed is always a convolution of primary and secondary processes, experiments in vacuum or in controlled atmospheres may help to address such questions.

The present work shows detailed experiments where spatially- and temporally-resolved optical emission spectroscopy of laser-produced plasmas on organic compounds has been performed. The experiments cover a pressure range from 1000 mbar to 10-3 mbar that allows a precise observation of the effect of the surrounding atmosphere in the formation of species by recombination.