

Spectroscopic analysis of plant materials with focusing on the Laser-induced breakdown spectroscopy (LIBS)

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Abstract

Laser-induced breakdown spectroscopy (LIBS) is a powerful tool for scanning of elemental spatial distribution within different analytes. Higher sensitivity of this method can be reached in double-pulse configuration (DP LIBS) in which the microplasma is re-heated with another laser pulse.

The application of LIBS for the mapping of elements (especially metals) within different plant tissues and organs will be presented. Mapping of metals in plant compartments is important for the better understanding of the metal uptake, transport, accumulation, interactions and protecting mechanisms of plants. Moreover the possibility to detect metals without difficult sample preparation is important for the environmental pollution monitoring or the check of phytoremediation processes. The application of LIBS technique to the analysis of algal biomass for industrial biotechnology will be also discussed.

For monitoring of environmental pollution by metals the plant and appropriate soil samples from the town Pyramiden in the Svalbard archipelago were collected and analyzed using ICP-OES and AAS methods.