

# System for Laser Ablation-ICP-Mass Spectrometry

ICP-Mass Spectrometer Spectro MS (Spectro / Ametek)

Excimer-Laser Ablation-System Analyte G2 (Photon Machines)

## Instrument Description:

The double-focussing ICP-mass spectrometer *Spectro MS* (Mattauch-Herzog geometry) allows for a simultaneous quantitative and semi-quantitative measurement of element concentrations or isotope ratio determination from mass  $^6\text{Li}$  to  $^{238}\text{U}$ . The mass spectrometer can be coupled with a *Photon Machines* excimer-laser ablation-System system which allows for the direct analysis as well as elemental imaging of solid samples. A lateral resolution down to  $5\ \mu\text{m}$  can be achieved.

## Application Examples:

- Biology:
  - Element/Isotope quantification of digested samples/solutions
  - Imaging of elemental/isotope distributions within whole organisms
  - Imaging of elemental/isotope distributions of single organ or tissue sections
- Geology:
  - Determination of elemental composition (integral as well as spatially resolved) of geological samples, i.e. rock samples and their inclusions
- Materials science:
  - Trace element analysis
  - Depth analysis of layer systems
  - Analysis of nanomaterials

## Requirements for Samples:

Both, an element analysis of solutions using an auto sampler as well as the ablation of solid samples by the coupling of the laser ablation system are possible. Since the ablation chamber is not operated under vacuum, the sample preparation is not as sophisticated as needed for ultra-high vacuum systems, for instance ToFSIMS or nanoSIMS. In addition, a chilled ablation-chamber is available allowing for the investigation of frozen samples or cryo sections. Glass slides or SEM stubs can serve as sample holders. However, an adaption to other sample holders is generally possible. In general, the dimensions of solid samples must not exceed that of a microscope slide.

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## Picture captions (from top):

- Spectro MS system
- Laser Ablation chamber
- Imaging of silver nanoparticle distribution in *Daphnia magna*
- Imaging of zinc distribution in zebrafish (*Danio rerio*) embryo

