

Geochemistry

Laser Ablation micro-sampling

UNIVERSITY OF
Southampton

Introduction

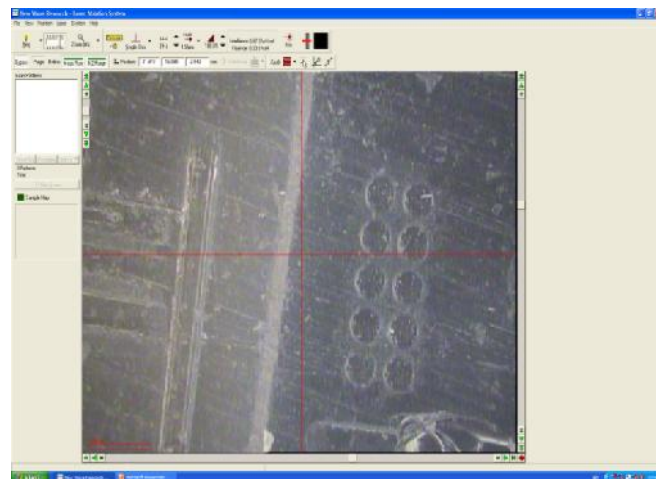
Laser ablation permits direct analysis at the micro-scale across a wide range of materials. A sample is positioned inside a chamber which is flushed with a carrier gas. A laser beam [typically 5-200 μ m wide] is focused onto the sample surface causing material to be ablated, which can then be transported to the plasma chamber of an attached ICP-MS instrument. This permits spatially resolved high sensitivity elemental and isotopic analysis and has found diverse applications in geology, materials science, biology, medicine and forensics.



Image: Electro Scientific Industries, Inc.

Consultancy Work

In addition to carrying out analyses to support research projects across Southampton University and through collaborations around the world, we also undertake bespoke analyses on behalf of commercial partners. We have a group of expert scientific and technical staff who are happy to engage in confidential discussions and provide quotes for interested users.



Laser ablation track (left) and spots (right) in NIST glass

Equipment

Our laboratories house a New Wave UP193FX laser ablation system. This system has a short pulse width (<4ns) 193nm excimer laser that produces a flat beam profile which has the advantage of reduced fractionation effects and low depth penetration. The system is self-contained and mobile, allowing it to be coupled to any of our ICP-MS instruments.

Applications

Recent projects utilising laser ablation include:

- Otolith trace element micro-chemistry.
- Sr isotopes in teeth.
- Pb isotopes in feldspar.
- B isotopes in coral, and foraminifera.
- Trace elements in volcanic minerals.
- Geochronology [zircon, U-mineral U-Pb, Lu-Hf].

Partners



EPSRC

Engineering and Physical Sciences
Research Council

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