

## **Advantages of LA-TOF-ICP-MS for analysis of geological materials**

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Time-of-flight inductively-coupled plasma mass spectrometry (TOF-ICP-MS) allows for simultaneous detection of the full mass spectrum at rapid (kHz) data collection rates. This aspect of the TOF technology is well suited to time-resolved analyses and so we have coupled the TOF-ICP-MS to a laser ablation system to assess performance on a range of geological materials.

Results show some clear advantages of the TOF-ICP-MS for laser ablation of geological materials over traditional quadrupole ICP-MS measurements. This is particularly true for analysis of small (few microns) inclusions hosted within minerals. These inclusion compositions can be extremely valuable for Earth Scientists to understand rock petrogenesis and ore deposit formation. Aspects of instrumentation investigated will be detection levels, precision, accuracy, signal to noise ratio and mass spectrum interferences. Additionally, due to the simultaneous detection of isotopes, the TOF-ICP-MS allows for higher precision isotope measurements which allows for investigation into isotopic composition differences between host mineral and inclusions or for isotopic compositional zoning within minerals using Pb as an example. We also highlight some of the limitations of the TOF-ICP-MS technique in the context of quadrupole ICP-MS instrumentation.