

Combining rapid 2D elemental imaging using LA-icpTOF with flexible interrogation software for the in-situ chemical analysis of meteorites

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Laser Ablation Inductively Coupled Plasma Time-Of-Flight (LA-icpTOF) mass spectrometry has been shown to be a powerful tool for rapid multi elemental analysis [1]. Coupling of the LA system to the icpTOF via Teledyne CETAC's ARIS fast aerosol transfer system permits high repetition rate mapping of samples. Combining these systems with recent developments in data interrogation tools within Iolite such as 'Monocle' now enables the rapid and flexible examination of elemental and isotopic data at micron scale spatial resolution [2].

We present high precision elemental and REE concentration and isotopic data for meteoritic components such as chondrules, CAI's and the matrix within the carbonaceous chondrite Allende (CV3) meteorite. The micron scale spatial resolution of the laser and simultaneous analysis of all ions by the icpTOF enabled the identification of presolar SiC grains within the matrix. The sample was also analysed by Scanning Electron Microscope (SEM) in order to relate the internal morphology of the chondrules to the REE patterns observed.

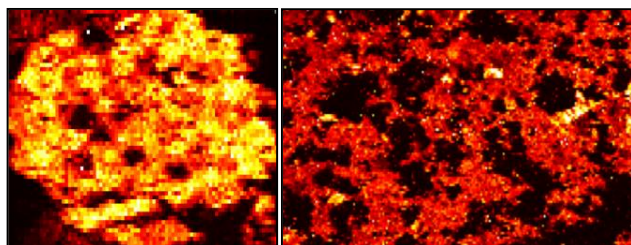


Figure 1. Image of Mg Intensity within a Chondrule with a field of view of 260 μ m (left) and matrix with a field of view of 960 μ m (right) from the carbonaceous chondrite Allende (CV3) meteorite.

[1] Van Malderen et al. (2017) *Anal. Chemistry* **10.1021**.

[2] Petrus et al. (2017) *this meeting*.