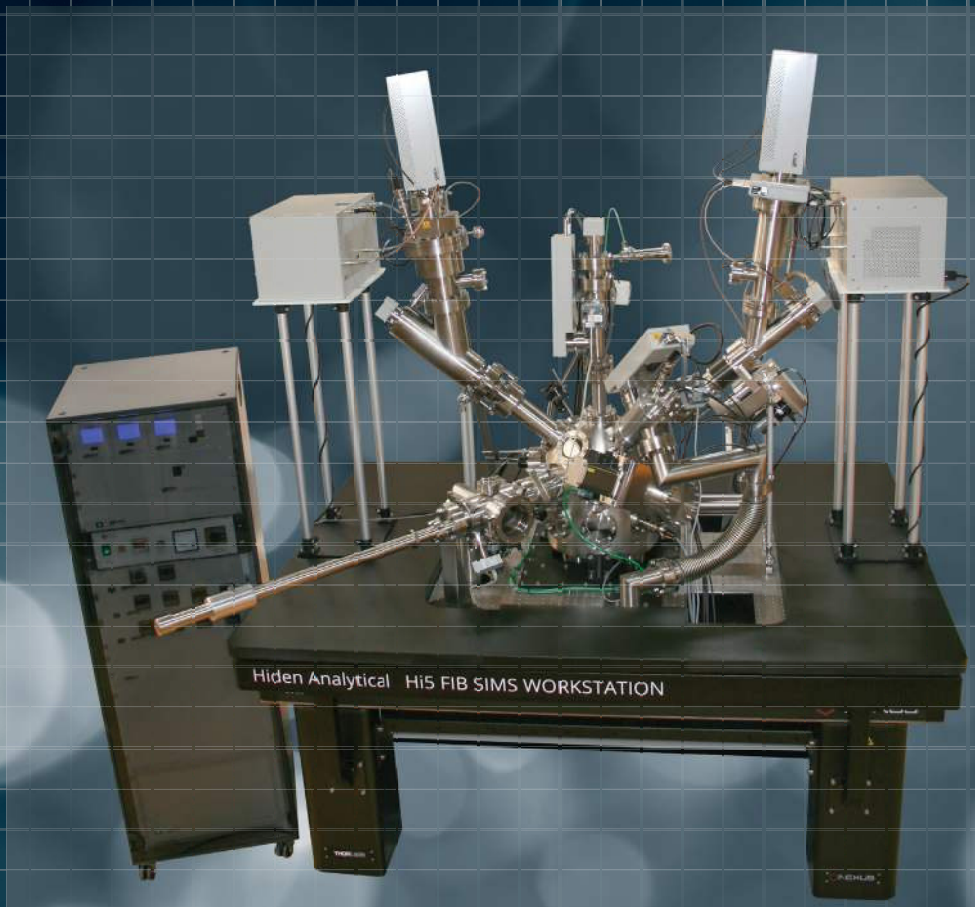


HIDEN ANALYTICAL

The NEW Hi5 SIMS An Industry first!

SIMULTANEOUS POSITIVE AND NEGATIVE ION ANALYSIS.

The Hi5 SIMS instrument, operates with a 40nm oxygen plasma FIB ion gun, high precision five axis sample stage and Hiden's unique DLS20 mass spectrometer capable of resolving mass peaks to 0.005 amu. The uniquely powerful tool is applied to aerospace, nuclear, medical and energy materials applications.



Hi5 SIMS instrument

- Metallurgical thin film studies with SIMS has traditionally needed two analyses to gain the full picture – not anymore!
- The new Hi5 instrument is an industry first collecting both the positive and negative ions at the same time, taking SIMS analysis to the next level.
- Features of nano-scale grain boundaries, layer interfaces and sub-micron particles can be analysed with confidence, with both positive and negative ion spectra recorded simultaneously.
- Critical sample volume is saved; no choice needed between which polarity analysis is best for your precious sample material, the Hi5 gives you both with unique parallel data acquisition.
- Simultaneous positive and negative ion images overlay with perfect alignment.

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Secondary Ion Mass Spectrometry [SIMS], is a surface analysis technique where a solid sample is bombarded by a focussed beam of energetic ions. Material removed from the surface is identified using mass spectrometry allowing the composition to be determined. With nanometre depth resolution and parts per million sensitivity, SIMS has a very diverse range of applications.

The sputtered material naturally forms either positive or negative secondary ions, so, in order to build a complete understanding of the sample, it is necessary to collect both polarities. Traditionally, this has meant making two separate analyses, or, in the case of a limited sample volume (like a particle), having to choose a single polarity for the measurement – effectively throwing away information.

The Hiden EQS quadrupole analysers have a low extraction field and placing two in opposition forms a highly efficient dual polarity detection system. As both positive and negative ions are collected simultaneously, there is no ambiguity about the registration of the images or depth profiles from each polarity. This means that small features, like grain boundaries, layer interfaces and sub-micron particles, can be analysed with confidence.

Key Features

- Dual EQS detectors can be fitted to any suitable sputter analysis chamber
- Allows efficient use of secondary ions and halves analysis time
- Images and depth profiles are accurately registered.

Applications

- Energy materials – solar and fuel cells
- Metallurgy – corrosion and passivation
- Failure analysis – surface chemistry, defect identification, functional coatings

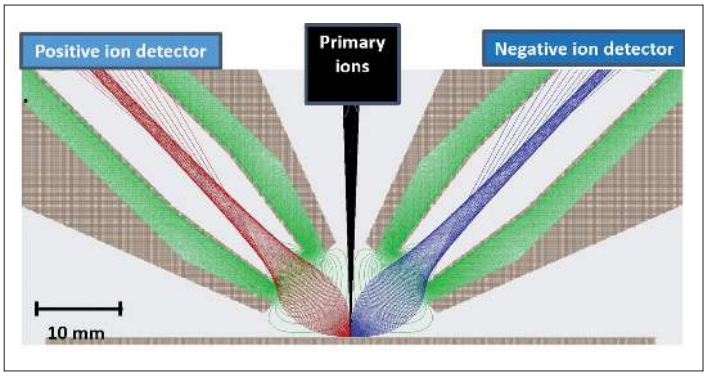


Figure 1. SIMION model showing efficient simultaneous +ve/-ve ion collection.

The balanced extract field formed by two opposing EQS spectrometers

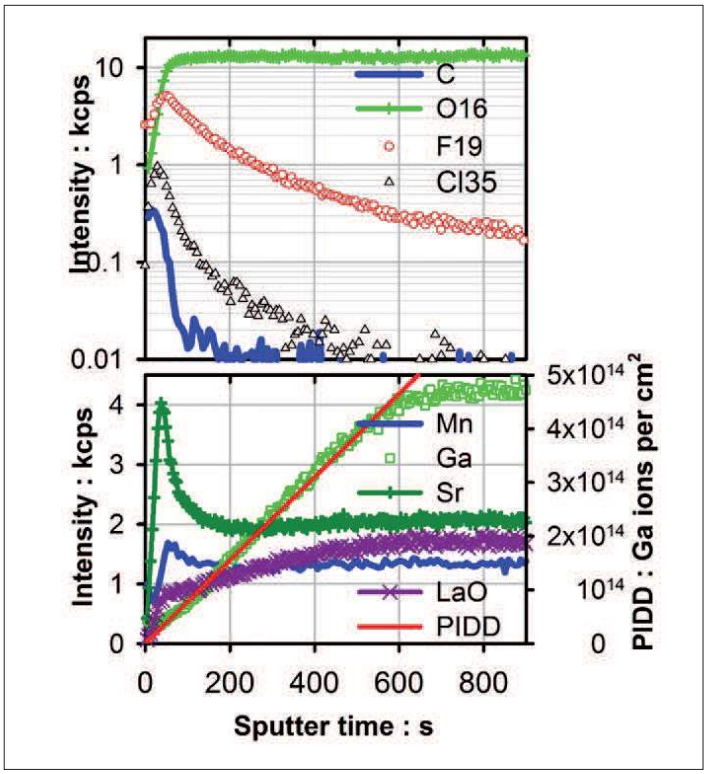


Figure 2. Simultaneous positive and negative analysis of Lanthanum Strontium Manganite solid oxide fuel cell Courtesy of Dr Chater, Imperial College London.

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