FIB-SIMS
Powerful Surface Analysis with Focused Ion Beam - Secondary Ion Mass Spectrometry Depth Profiling
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Introduction

FIB-SIMS is a very powerful surface analytical technique especially for high sensitivity nano-scale materials analysis. Elemental detection limits range from parts per million to parts per billion. Generate elemental surface, image and depth profile information by mass spectrometry. Use the FIB-SIMS to analyze the composition of solid surfaces and thin films with a focused primary ion beam and collecting and analyzing ejected secondary ions. SIMS is considered to be a qualitative technique, although quantitation is possible with the use of standards.

Benefits

- Analysis of trace elements down to ppm (parts per million) level (thin films, semiconductors, solar cells)
- Isotope detection
- Elemental mapping and depth profiling
- Detection of atomic and molecular ions
- 50 nm lateral analytical resolution possible (better than conventional SIMS)
- A primary beam of energetic ions, typically in the range of 500 V up to 30 kV is used to sputter or erode the surface of the material under analysis

Availability

The FIB-SIMS is available for the following microscopes:
- AURIGA series
- NEON series
- 15xx series
- XB 340, XB 540

Operation

A primary focused ion beam is interacting with the surface and generates charged (electron, ions) and uncharged (molecules and elements) particles (see fig. 1). The sputtered charged ions / molecules are directed into the detector by electric fields. The ions pass through an energy analyzer and through a mass analyzer. The mass and energy resolved ions are detected using a secondary electron multiplier. Sputtered ions from milling are collected and analyzed by mass spectroscopy. The detected ions provide analytical information. SIMS is a very surface sensitive technique because secondary ions emit only from the upper monolayers of the sample.
Upgrade Info

Fig. 1

Upgrade path

<table>
<thead>
<tr>
<th>Part</th>
<th>Ordering no.</th>
</tr>
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<tbody>
<tr>
<td>Upgrade Kit SIMS EQS</td>
<td>346565-8002-990</td>
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<tr>
<td>Upgrade Kit SIMS CUST XB</td>
<td>346565-8003-990</td>
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<td>Upgrade Kit SIMS CUST AC</td>
<td>346565-8004-990</td>
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<td>Installation and on site training (3 day system installation and training at customer site provided by Hiden Analytical Ltd.), Europe</td>
<td>346565-8005-000</td>
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<td>Installation and on site training (3 day system installation and training at customer site provided by Hiden Analytical Ltd.), USA &amp; Canada</td>
<td>346565-8006-000</td>
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<td>Installation and on site training (3 day system installation and training at customer site provided by Hiden Analytical Ltd.), Far East</td>
<td>346565-8007-000</td>
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<td>Additional 12 months warranty extension (cumulative up to a maximum of 5 years total)</td>
<td>346565-8008-000</td>
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A technical feasibility check has to be performed before issuing a quotation.

A system preventive maintenance performed within the last 12 months is mandatory.

The retrofit must be performed by a ZEISS-authorized service engineer.

Application training is recommended.

For further information, contact: microscopy@zeiss.com