Upgrade Info

FIB-SIMS

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

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FIB-SIMS

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

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Analyze the composition of solid surfaces and thin films by sputtering the surface of the specimen.

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.

Availability

The FIB-SIMS is available for the following microscopes:

- AURIGA series
- NEON series
- 15xx series
- XB 340, XB 540

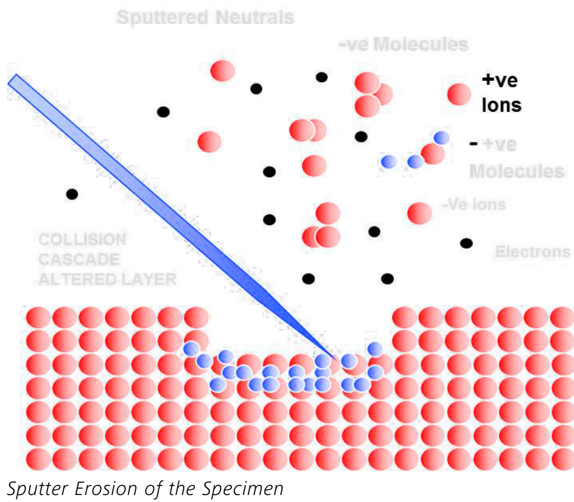
Benefits

- 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

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.

Figure 1



Sputter Erosion of the Specimen

Upgrade path

Software	All SmartSEM versions
Hardware	SIMS port required
	FIB column

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

Part	Ordering no.
Upgrade Kit SIMS EQS	346565-8002-990
Upgrade Kit SIMS CUST XB	346565-8003-990
Upgrade Kit SIMS CUST AC	346565-8004-990
Installation and on site training (3 day system installation and training at customer site provided by Hiden Analytical Ltd.), Europe	346565-8005-000
Installation and on site training (3 day system installation and training at customer site provided by Hiden Analytical Ltd.), USA & Canada	346565-8006-000
Installation and on site training (3 day system installation and training at customer site provided by Hiden Analytical Ltd.), Far East	346565-8007-000
Additional 12 months warranty extension (cumulative up to a maximum of 5 years total)	346565-8008-000

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