



ONYX

The largest-stage tabletop SEM. Built for more.

ONYX at a glance

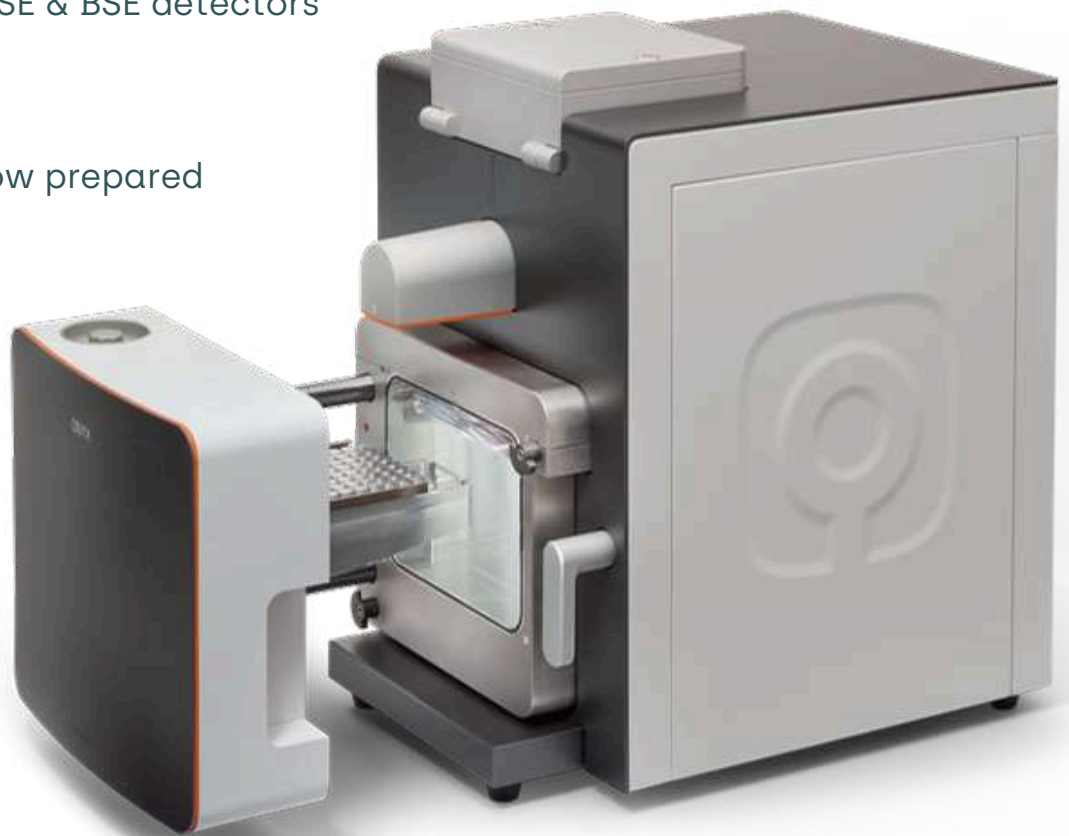
Largest stage tabletop SEM

Large & multiple sample capability

High-performance SE & BSE detectors

Embedded EDS

Automated workflow prepared



<8 nm

resolution

110 x 110 mm

motorized stage

1-20 kV

accelerating voltage

embedded EDS

point • line • mapping

low maintenance

user-replaceable source

ease of use

intuitive Discover software

Designed for large samples and high throughput

The ONYX large stage enables the analysis of larger components and multiple samples in a single setup. Its 110 × 110 mm motorized stage supports up to 64 half-inch SEM sample stubs, providing the flexibility needed for efficient, higher-throughput workflows.

220 x 220 mm

chamber size

up to 50 mm

max sample height

110 x 110 mm

XY stage travel

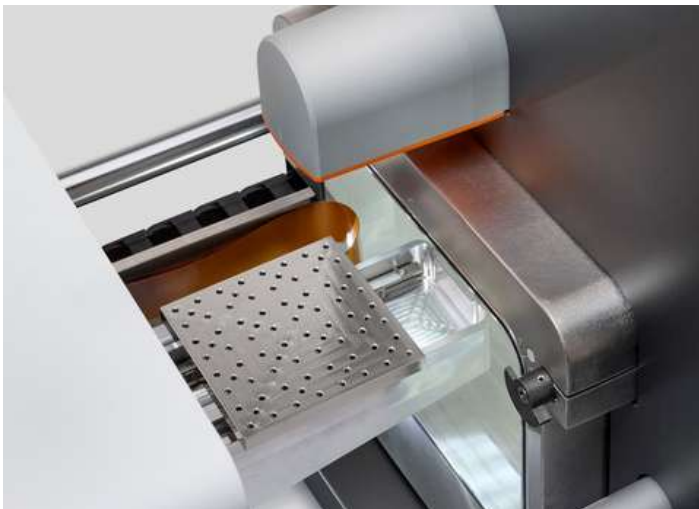
The ONYX tabletop SEM features the **largest sample stage of any tabletop SEM** and delivers intuitive, automated solutions that **reduce manual repetitive tasks**.



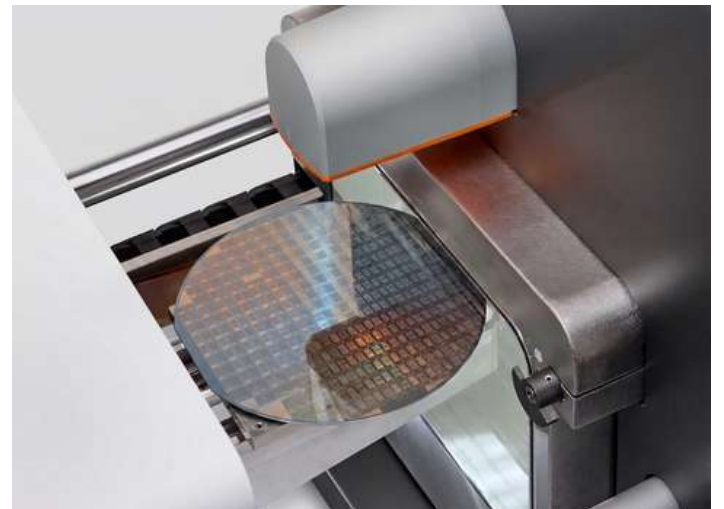
Load up to 16x 1 inch stubs



Load up to 64x half inch stubs



Stub plate



Load large samples (e.g. semicon wafer)

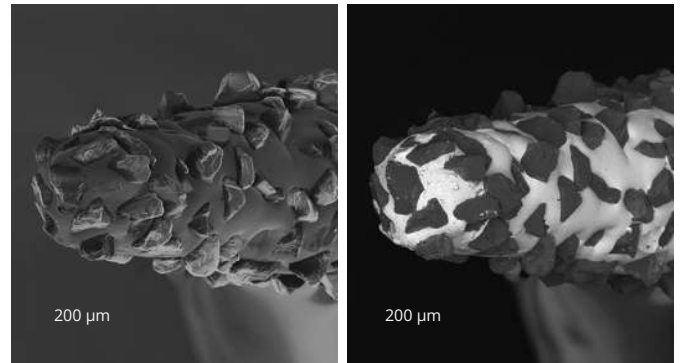
Powerful imaging and analytical performance

The ONYX tabletop SEM offers high-resolution SEM imaging with low cost of ownership, along with embedded energy dispersive spectroscopy (EDS) for fast, accurate elemental analysis.

High-quality detectors

High-performance SE and 4 quadrant BSE detectors deliver outstanding surface detail, compositional contrast and mixed-mode imaging.

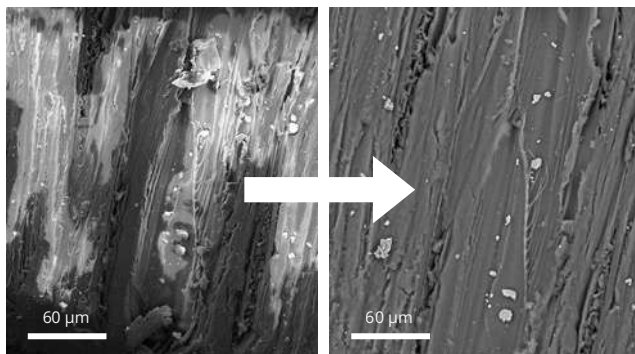
- SED
- BSD
- Mixed mode SE & BSE image viewing



Advanced features

Reduce charging

Low vacuum imaging for non-conductive samples

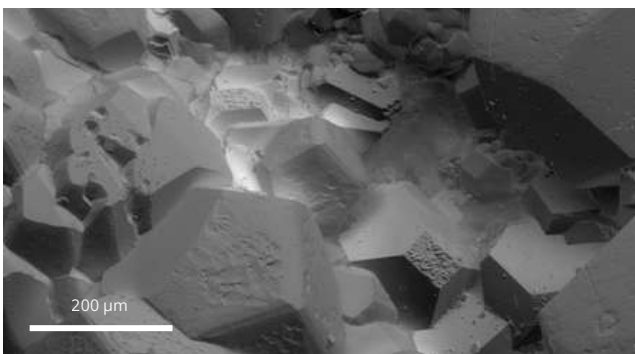


Uncoated wooden toothpick (high vac)

Uncoated wooden toothpick (low vac)

Topographical mode

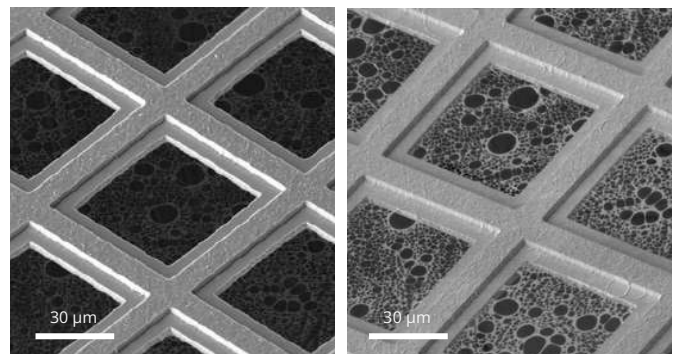
Enhanced visualization of surface topography



Crystalline rock

Low beam imaging

High-quality imaging down to 1 kV



Holey-carbon grid @ 20kV

Holey-carbon grid @ 1kV

User-Replaceable Electron Source

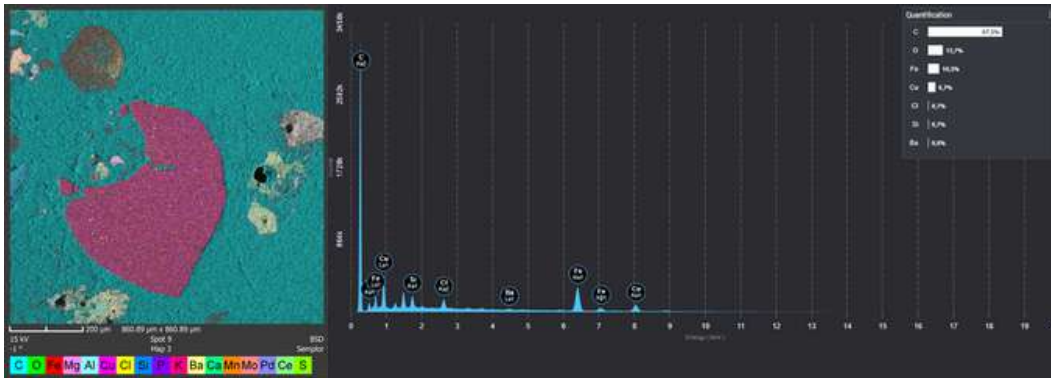
Minimize downtime and no costly source replacement



Source alignment tool included with the ONYX

Embedded EDS from acquisition to reporting

Semplor's Discover EDS software combines SEM imaging, elemental analysis and reporting in one intuitive suite, delivering fast, reliable and efficient analytical workflows.

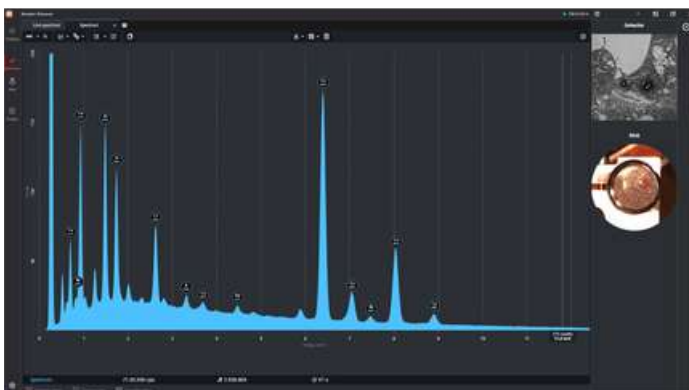


<129 eV
energy
resolution

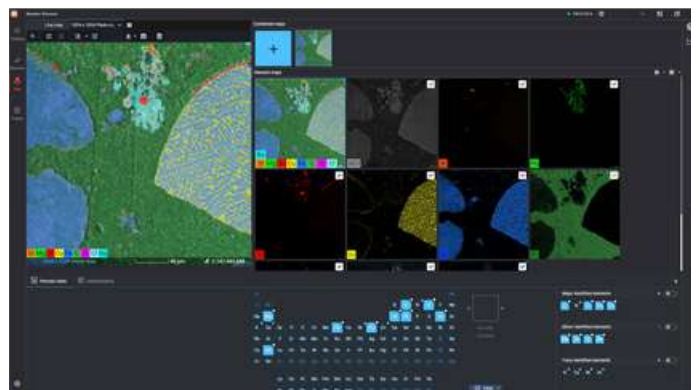
B [5] – Am [95]
detectable
element range

Intuitive operation with Discover EDS software

- ✓ Live Mapping for Instant Visual Feedback
- ✓ Instant Element Identification & Quantification
- ✓ Advanced Map Blending
- ✓ Line Scan Analysis
- ✓ All-in-One Project Structure
- ✓ One-Click Reporting



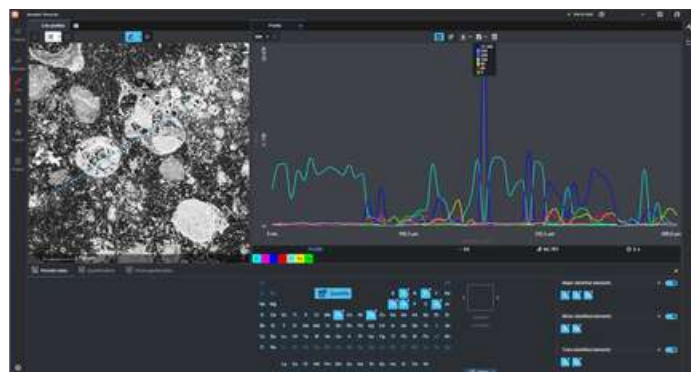
Live spectrum



Element mapping



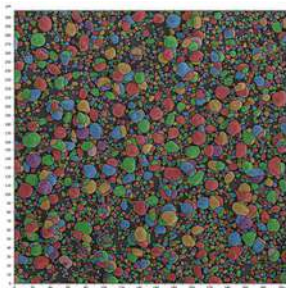
Label and compare spectra



Line scan

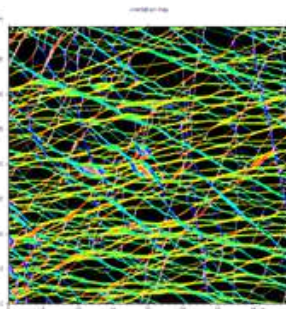
Advanced analysis at your fingertips

The Semplor Explore App transforms standard SEM imaging into advanced material characterization—particle, fiber, and 3D analysis—all embedded into your ONYX tabletop SEM. Seamlessly integrated in the ONYX interface, these optional modules are only a click away, ensuring a smooth and efficient workflow without leaving your SEM environment, giving fast answers to your questions.



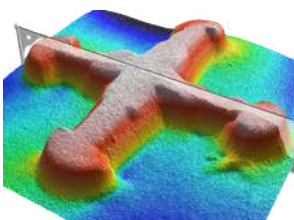
Explore Particles

Detects, measures, and classifies particles, pores, or grains, including touching particles. Delivers size, shape, and count data with exportable statistical reports.



Explore Fibers

Measures fiber diameter, orientation, and curvature, including overlapping fibers. Generates orientation and pore statistics, exportable for reporting.



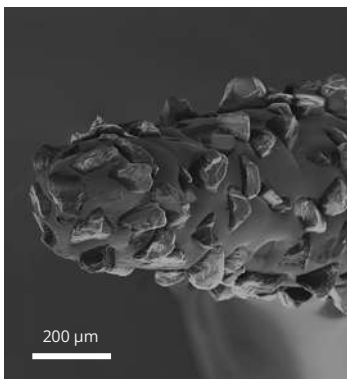
Explore 3D

Generates 3D reconstructions and height maps from SEM images, using stereo-pair, four-quadrant BSE, or single-image methods, providing both visual and quantitative surface data.

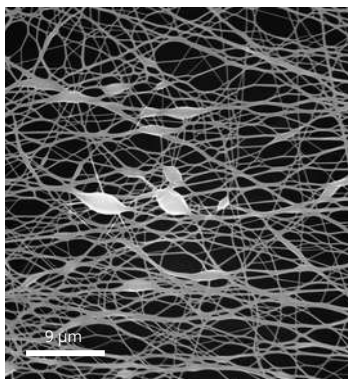
Unlock the full analytical power of your ONYX tabletop SEM.
The Semplor Explore App delivers particle, fiber, and 3D analysis
in one integrated solution.

Compact, robust & versatile tabletop SEM

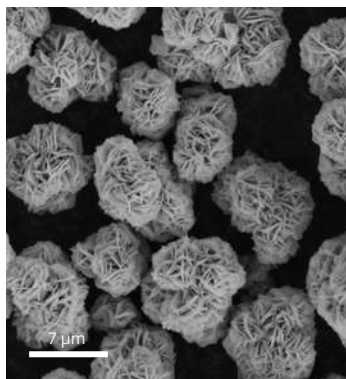
ONYX is a robust tabletop SEM designed using the latest technology to deliver fast, high-quality imaging and elemental analysis. Its compact design and largest stage in its class make it ideal for a wide range of applications, including R&D, industrial and research & education. The ONYX provides immediate access to SEM capabilities, making it perfect for users looking to reduce reliance on external SEM services or larger floor-model instruments. With a small footprint, excellent system stability and no need for dedicated infrastructure, the ONYX fits seamlessly into any lab environment.



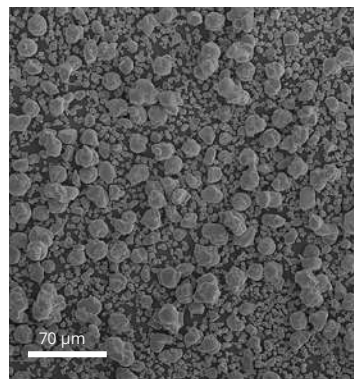
Dentist drill bit



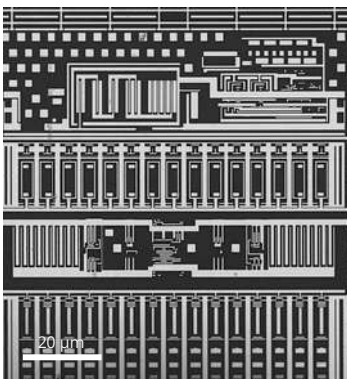
Non-woven fiber



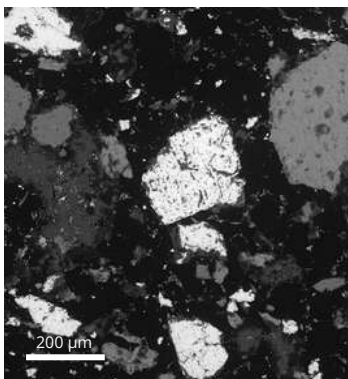
Mining ore



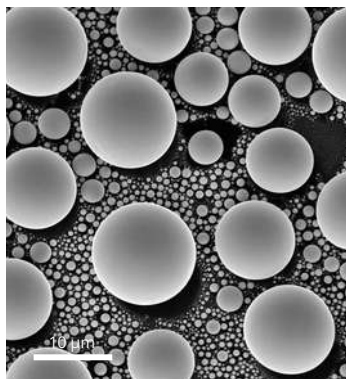
LiCoO₂ particles



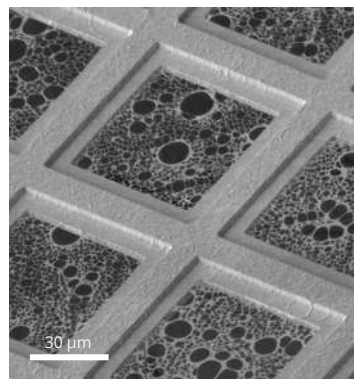
Chip



Iron ore cross-section



Tin balls



Holey carbon grid @ 1kV

Specifications

IMAGING MODE

Optical

0.7 & 2.5x with up to 12.5x

SEM

Magnification range: 100 - 200.000x

Resolution

< 8 nm

Capture resolution

Up to 4096 x 4096 pixels (4K)

ILLUMINATION

Light optical

Bright field

Electron optical

Optimized thermionic source (tungsten)

Lifetime: 1000+ operating hours in ECO-mode

Acceleration voltages

Default: 1, 2, 5, 7, 10, 15 & 20 kV

DETECTORS

Secondary electron detector (SED)

Backscattered electron detector (BSD) – 4 quadrant

Energy Dispersive spectroscopy detector (EDS) – embedded

Full-color

LIGHT OPTICAL NAVIGATION CAMERA

IMAGE FORMATS

JPEG, TIFF, PNG, BMP

USER INTERFACE

Communication, imaging and analysis use a single monitor with control via a wireless mouse & keyboard.

Remote control and diagnostic enabled.

Network, USB, workstation

SAMPLE STAGE

Computer-controlled motorized X Y travel: 110 x 110 mm

Up to 50 mm height

Up to 16x 1" stubs or 64x 1/2" stubs

Electrical and fluid feedthrough

220 x 220 mm

VACUUM CHAMBER

EDS SPECIFICATIONS

Detector type

Silicon Drift Detector (SDD), thermo-electrically cooled

Detector active area

30 mm²

Energy resolution

@ Mn K α < 129 eV

Max. input count rate

300,000 cps

Take-off Angle

30°

Hardware integration

Fully embedded SDD, pulse processor and scan generator.

Installed on Windows PC and controlled via user interface.

EDS point analysis, line analysis and mapping.

Reporting & export functions.

SOFTWARE

SYSTEMS SPECIFICATIONS

Footprint

420 (w) x 605 (d) x 625 (h) mm

Weight

95 kg

Pumps

Pfeiffer Turbo molecular pump

Pfeiffer oil free membrane pre-vacuum pump

Motor controlled vacuum levels via the user interface.

High vacuum SEM mode (standard)

Low vacuum mode (standard): vacuum of 40 Pascal for reduced charging.

Workstation

Pre-configured PC with a 27" monitor.

SEM imaging and EDS Analysis software installed.

AMBIENT CONDITIONS

Temperature

15°C – 25°C (59°F - 77°F)

Humidity

20 - 80% RH

Geological height

Up to 2000 meters

Power

System in typical power imaging mode: 110 W (max. 140 W)

Find your distributor at www.semplor.com/distributors

Learn more at www.semplor.com

