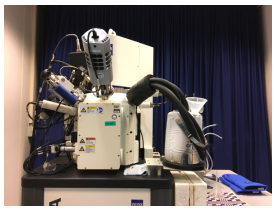
Ultra high resolution (cryo-) FIB-SEM

https://search.researchequipment.wur.nl/SearchDetail.aspx?deviceid=834d0606-1031-4889-befd-688d41dddfaa



Brand

Zeiss

Type

Auriga

Contact

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Organisation

Plant Sciences Group

Department

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Description

Scanning electron microscopy (SEM) is a technique used for observation and analysis of the micro- and nanostructure of sample surfaces. The combination of SEM with a Focused Ion Beam (FIB-SEM) makes it possible to obtain sequential cross sections through the sample, which can be constructed into a full 3D representation of the internal structure. Using a Gas Injection System (GIS), materials with various electrical properties can be added by vapor deposition from a suitable gas to avoid artefacts due to milling. For soft materials, like emulsions and foods, the microscope can be used under cryogenic conditions (cryo-(FIB-)SEM). X-rays are emitted when the electron beam hits a sample, with an energy that is characteristic for each element. These can be detected with an Energy Dispersive X-Ray Detector (EDX), which enables identification of the composition and measurement of the abundance of elements in a sample. This equipment is part of the equipment portfolio of Unilever made available for sharing through Shared Research Facilities.

Technical Details

FIB-SEM Zeiss Auriga (Crossbeam)
• Ultra high-resolution field emission scanning electron microscope
• Schottky Field Emitter
• Focused Ion beam (Ga liquid metal ion source)
• Single Gas Injection System (GIS) – Platinum precursor
• Charge compensation
• Inlens, SE (Everhart-Thornley) and EsB (Energy and Angle Selective) detection
• SmartSEM user interface
• Gatan Alto2500 cryotransfer(/coating) system
• EDX Oxford 80 mm detector – Aztec user interface
• Resolution down to 1 – 2 nm (at 30 – 1 kV), Ga FIB resolution ~ 3 nm

Applications

Wide range of applications in the area of food science, life science, plant science and material science.

Complementary Techniques

(cryo)-TEM
Sample preparation facilities
State-of-the-art facilities for sample preparation are available in the WEMC, among which:

- Sputter coating and carbon coating
- Critical point drying

Especially for cryo-samples:

- Plunge freezing
- Mirror freezing
- Freeze substitution (Leica AFS)
- High pressure freezing (Leica HPM100)
- Cryo-ultramicrotome (Leica UC7/FC7) including glove box to provide low humidity environment