

Scanning Electron Microscope setup



Technical description:

SEM microscopes with electron (FEG) and ionic columns (Gallium – Scios 2). The SEMs include EDS spectrosopes (EDAX), catodoluminescence (GATAN AMETEK) and time of flight secondary ions mass spectroscope, TOF-SIMS. The microscopes are equipped with a broad selection of semiconductive and scintillated detectors, including the STEM one. Both, electrostatic and electromagnetic optics are implemented. The Scios 2 has a micromilling feature with focused Gallium ion beam, enabling it to prepare the TEM thin films. The Scios 2 microscope is also equipped with the secondary ion detectors and is capable to visualize a sample with secondary electrons emitted as a result of interaction with primary ion beam. The Apreo 2 includes EBSD detector as well as ECCI mode (electron channeling contrast imaging). Both the microscopes are also able to work in low vacuum mode, 10 – 500 Pa.

Trade name: ThermoFisher Scientific Apreo 2, Scios 2

More details: </equipment/zestaw-do-mikroskopii-skaningowej/>

Access type: External

Type of accreditation / certificate: Not applicable

Contact person: Ziabka Magdalena

Contact person url: <https://api.skos.agh.edu.pl/osoba/magdalena-ziabka-6972.html>

Responsible body: Department of Ceramics and Refractories

Group / laboratory / team: Departmental Laboratory of Scanning Electron Microscopy and Microanalysis WIMiC Group of the Microstructural Analysis of the Materials <http://kcimo.pl/pl/grupa/Grupa-Analzy-Mikrostruktury-Materialow>

Last update date: May 24, 2023, 2 p.m.

Year of commissioning: 2023

IDUB research areas:

(PRA 5) Materials, technologies, and processes inspired by nature: biotechnology, bioinspirations in engineering and materials science, biosensors, bioenergetics, biocatalysis, biocomputers, and biocomputation

(PRA 7) Design, production, and testing of modern materials and the technologies of the future based on a multidisciplinary approach combining materials engineering with chemistry, physics, mathematics, and medicine

Research capabilities:

Surface and 3D imaging also with the orientation and electron channeling contrast, mapping of the elements, optical properties measurements and electronic structure studies (CL), measurements of crystalline structure (EBSD) and its defects (dislocations, etc.), micro-milling.

Measurement capabilities:

Accelerating voltage for electron beam 0.2 - 30 kV and 0.5 - 30 kV for ion beam. Landing energy: 20eV to 30 keV. Electron beam current 1 pA to 50 nA. Ion beam current 1.5 pA to 65 nA. EDS down to Beryllium (spectra resolution 129 eV). TOF-SIMS up to 500 u. Standard WD 7 and 10 mm.

Maximum HFW: 3mm. Chamber vacuum up to 7×10^{-6} Pa (HVac) or 10 - 500 Pa (LVac). Maximum sample diameter: 122 mm, standard 5 mm. Stage tilt -15/+90°.

Conditions for providing infrastructure:

Operation only by the staff of Departmental Laboratory of Scanning Electron Microscopy and Microanalysis WIMiC. Order/contract/other form of collaboration upon arrangement.