NANOTECNOLOGIC PLATFORM CATSUD

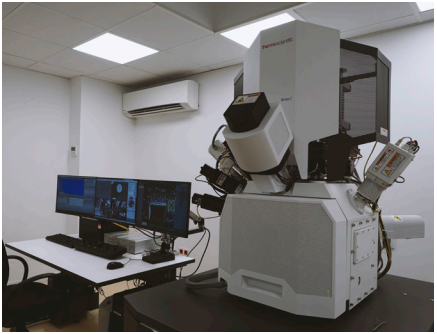
The CATSUD URV Technological Platform is an innovative and cutting-edge project. Its mission is to provide professionals and the scientific community with the most advanced nanometric infrastructures. The aim is to get two new high resolution electron microscopes, which will be integrated into the Microscopy and Nanometric Techniques Unit, where there is other equipment working on the same scale, such as atomic force microscopes and those used for nanofabrication in the Clean Room. All this will create a powerful platform for research and analysis on a nano and subnanometric scale.

The platform has qualified and experienced professionals to offer advice, solutions and responses to the problems.

This project is cofinanced by the European Regional Development Fund of the European Union in the framework of the ERDF Operational Program of Catalonia 2014-2020 with a grant of € 1,299,000.

UNIVERSITAT ROVIRA i VIRGILI

200 nm



FESEM-FIB

FESEM-FIB is a dual beam scanning electron microscope. The field emission electron source can obtain high resolution images (resolution of 1 nm). The galium focus ion beam enables 3D characterization of all kinds of materials, including magnetic and isolating materials.

The microscope has several detectors: in-column for the detection of different energy electrons, STEM to work in transmission mode and an energy dispersive X-ray detector. It also has a micromanipulator and four gas injectors for nano-structure building or etching and lamela preparation for transmission electron microscopy (thickness less than 70nm).

APPLICATIONS

01. Ultra-high resolution imaging of a wide range of samples, including magnetic and non-conductive materials

02. Fast and easy preparation of high-quality, site-specific, TEM samples using the ion column

03. The most complete sample information obtained from a variety of integrated detectors

04. Subsurface and 3D information with precise targeting of the region of interest using the most advanced software

05. Serial nanometric cuts for future 3D tomographic reconstruction

06. Precise sample navigation thanks to the high flexibility stage and in-chamber navigation camera

07. Chemical and crystallographic studies of sample microstructures

08. Building of new structures or modification of existing ones thanks to the FIB and the different gases

FETEM

The FETEM 200 kV is a high resolution transmission electron microscope (resolution of 0.1nm) with an integrated field emission gun. It is a multipurpose piece of equipment able to work in TEM and STEM modes and is equipped with analytical techniques of energy dispersive X-ray spectroscopy (EDX), which means that it can obtain images with an atomic resolution of the morphology, structure and composition of a sample.

APPLICATIONS

01. Material size and morphology information (TEM)

02. Crystalline structure: crystalline planes position, study of defects, impurities or minority elements present in pure materials (electron diffraction and ultra-high resolution HRTEM), determination of the unit cell

03. Sample compositional information: scanning-transmission image (STEM) with detectors for bright field (BF), dark field (DF) and high angle annular dark field (HAADF) which provide phase contrast for elements with different atomic numbers

04. Three-dimensional (3D) image reconstruction: material characterization on a nanometric scale in all three dimensions

05. EDX composition maps and profile acquisition

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN
Generalitat de Catalunya
Departament d'Empresa i Coneixement
Secretaria d'Universitats i Recerca
Unió Europea
Fons Europeu
de Desenvolupament Regional

UNIVERSITAT ROVIRA i VIRGILI

SERVEI DE RECURSOS CIENTÍFICS I TÈCNICS
Campus Sescelades
Avinguda dels Països Catalans, 26, 43007 - Tarragona
977 559 747 - martin.yebras@urv.cat
www.urv.cat/srcit