



STORAGE RESEARCH INFRASTRUCTURE ECO-SYSTEM

RI Information sheet 2022

High Council of Scientific Research (CSIC)

NanoQuim

Cross-Cutting

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Project Acronym	StoRIES
Call	H2020-LC-GD-2020
Grant Agreement No.	101036910
Project Start Date	01-11-2021
Project End Date	31-10-2025
Duration	48 months

1. Photo



<https://services.icmab.es/nanoquim/>

2. Geographical coordinates

N 41° 30' 7.588''N, 2° 6' 37.319''E

or 41.50210783092121, 2.1103665405313548

3. Description of the research infrastructure for the webpage

Nanoquim Platform offers five independent cleanroom facilities classified as ISO7, which corresponds to a Class 10,000 cleanroom according to FED STD 209E. These labs are equipped to develop different types of chemical and physical processes, like the physico-chemical synthesis and optical Lithography.

The independent labs are.

3.1 Advanced Optical Lithography Lab

Equipped with

- Photolithography Fume Hood: Photolithography hood equipped with an AC 6000 Spinner, a precision hotplate, a hot/stirring plate and an ultrasonic bath for working with photoresists.
- Micro-Writer ML3: A last generation micro-writing device with high performance laser-assisted technology.
- Ellipsometer GES5E from Sopra (with porosimeter): Allows various measurement modes from standard to generalized ellipsometry, going through photometric measurements, scatterometry and luminescence

measurements. Allows for the characterization of thin films' properties like composition, roughness or thickness through changes in polarization.

- Plasma Cleaner Zepto M2: Low-pressure plasma technology that allows for surface alterations like etching and activation processes, precision cleaning and polymerization on surface.
- Optical Microscope Nikon Optiphot: The Optical Microscope Nikon Optiphot is a suitable equipment for a fast evaluation of photolithographic experiments.

3.2 Characterization at the Nanoscale of Functional Materials Lab

- IR-Spectrometer Vertex 70 from Bruker: Fully digital FT-IR spectrometer for signal acquisition from the far IR region. Equipped with MTC and TGS detectors.
- Binocular Loupe: For the fast evaluation of samples.
- Optical Microscope B-600 MET: A versatile tool for several processes in the laboratory.
- Ultrasonic Wire Bonder 4526: Manual Ball Bonding System that provides the high yield and excellent repeatability needed for every gold ball bonding
- Profilometer P16+ from KLA Tencor: Surface metrology analysis solution with applications in R&D Departments, Universities, production and process monitoring.

3.3 Physico-Chemical Characterization and Nanofabrication Lab

- Spectrofluorometer LS 45: This fluorescence spectrometer offers versatility and reliability for routine analyses, using a range of accessories and software for many applications.
- Atomic Layer Deposition System Savannah: Designed to deposit pinhole free coating with uniform thickness, with precise controls and high film quality.
- Rheometer HAAKE RheoStress RS600: Fully modular, upgradeable controlled stress research rheometer that suits a wide range of requirements, allowing for shear and stress controlled flow curves, stress controlled ramps, creep and recovery, oscillating tests and temperature control tests, amongst others.

- Reactive Ion Etcher RIE 2000 CE: Provides a clean environment for anisotropic etching of several materials. Equipped with oxygen, argon and tetrafluoromethane gases together with mixtures of oxygen/tetrafluoromethane.
- Metal Evaporator System Auto 306: Achieves high vacuum values for an optimal physical deposition of the target (gold, chromium, aluminum, titanium, silver, among others) to the sample.
- Ion Milling/Sputtering/E-Beam System: Combination of three systems in one that allows for different
- Centrifuge Allegra 64R: Brushless, induction drive refrigerated centrifuge that performs routine spins on the lab bench for high-speed separations.
- Stove UNB 500 from Memmert: This Stove is thought for drying material.

3.4 Chemical Synthesis Lab

- Basic I-Solvents: Fume hood for working with solvents or non-corrosive substances.
- Basic II-Acids & Corrosives: Fume hood for working with corrosive substances.
- Vacuum Line: Equipped with a cold trap and four manifolds for simultaneous work within a fume hood.
- Rotary Evaporation System R-210/215: For faster and more effective evaporation of the more volatile solvent in a solution.
- Spin Coater Spinner CZ-650: Allows for the deposition of substrates over surfaces by fast rotation.
- Glove Box GP(Concept)-II-P: Constantly purified and over pressurized nitrogen environment to develop processes sensitive to oxygen and water.
- Microwave Oven with controlled atmosphere Discover Explorer Hybrid from CEM: The system facilitates either homogenous or heterogeneous solution phase chemistry, solid phase chemistry or chemistry conducted on solid supports, under controlled conditions.
- Microwave from Milestone: Equipped with several accessories for a range of experiments, with a focus on liquid-liquid synthesis, solid-solid synthesis, and for digestion experiments.

- Drop Shape Analyzer DSA 100: With a manual drop system and many options for contact angle measurements. Equipped with a software loaded with different models to determine the contact angle and surface tension of a liquid.

3.5 Highly Control Humidity Lab

- ICMAB-CSIC Ink-jet Printer: ICMAB's own prototype.
- Rapid Thermal Annealing Furnace: For the thermal treatment of samples up to 1200°C, developed specifically for research requirements.
- Tubular Furnace ST 1002540
- Furnace that reaches up to 1150°C thanks to refractory components. Equipped with wax evacuation tray, wax gathering drawer and gas exhausting evacuation system.
- Mini Tubular Furnace
- Inert Atmosphere Chamber: Chamber with low humidity and oxygen levels for chemical and physical processes. Equipped with a SMA AC 6000 Spinner.
- Chemical Hood: Hood with highly controlled humidity.
- Dip Coater DipMaster 201: Accommodates substrates up to 12" x 12", with a withdrawal speed range of 0.5" to 4.0" per minute and a manual temperature control with a maximum infrared oven temperature of 80°.

4. Availability of the research infrastructure

The installation is not available during the standard Holiday periods, when maintenance operations are running or when the maximum occupancy limitation does not allow the entrance in the rooms. A specific calendar should be previously agreed.

5. Special considerations (confidentiality / NDA agreements, insurance requirement, special training, HSE training)

The users should attend a course for enter the room and also for operating with the agreed instruments. Operation should be supervised by the scientific and technical staff

6. Energy storage technology that can be analysed/studied by using the research infrastructure



Nanoquim Plattform is a crosscutting infrastructure devoted to materials research and development including synthesis at, samples preparation, and characterisation. Nanoquim Plattform includes the facilities needed to control of the materials down to the nanoscopic level allowing the synthesis of specific nanostructures. The fields of activity support cover the areas of development at the lab level. Its transversal characteristic includes materials for not specific technologies

- Electrochemical
- Chemical
- Thermal
- Mechanical
- Superconducting Magnetic
- Cross-cutting (Specifically: ...)

7. Key words for the webpage

[ICMAB Cleanroom](#)

[Nanoquim Plattform](#)

[ICMAB - Home](#)

8. TRL level (if applicable):

- 1-3
- 4-6
- Above