INORGANIC ELECTROCHEMISTRY and NANOMATERIALS

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INORGANIC ELECTROCHEMISTRY AND SURFACE CHARACTERIZATION LABORATORY

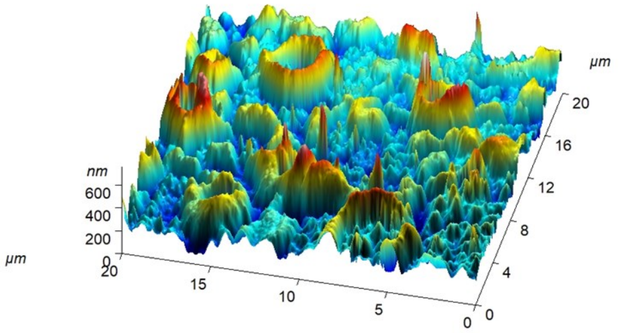
Research activity

The research activity mainly concerns with the development of new materials for environmental and biomedical applications, through:

- ✓ Chemical and electrochemical deposition of surface layers of organic, inorganic and hybrid materials
- ✓ The study by voltammetric techniques of inorganic/organometallic complexes and molecules of pharmacological interest
- ✓ Characterization of composition and structure of solid surfaces and nanoparticles
- ✓ Spectroscopic characterization (UV-vis, FTIR, FTIR-ATR) of liquids, films and powders in transmission and reflection

Images


NT-MDT
NT-MDT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nm
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400
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15
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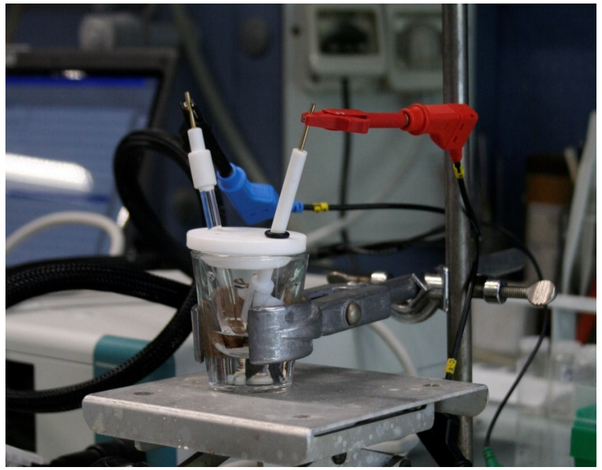
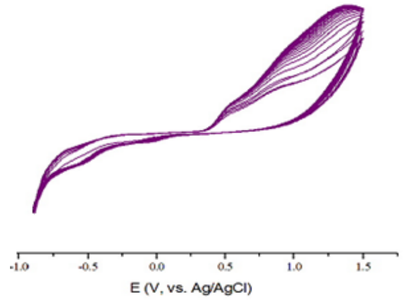
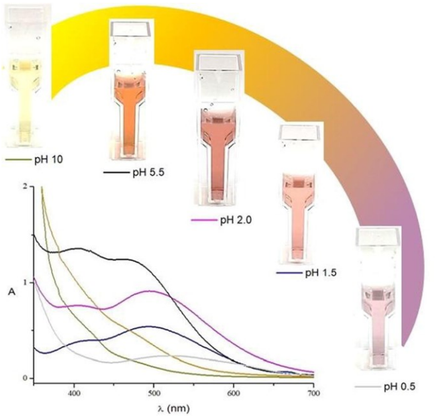
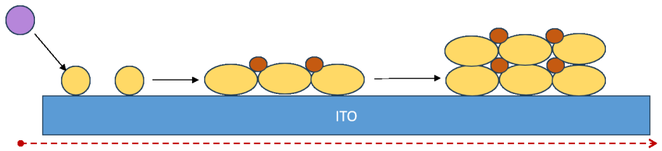
µm
20
16
12
8
4
0




-1.0
-0.5
0.0
0.5
1.0
1.5
E (V, vs. Ag/AgCl)


pH 10
pH 5.5
pH 2.0
pH 1.5
pH 0.5
A
λ (nm)


ITO

Technologies and services

✓ **Atomic Force Microscopy (AFM)**

The AFM microscope can be used for the morphological characterization at nanometric scale of materials, of coatings, mirrors, lenses, etc.

✓ **Potentiostats and galvanostats**

These tools are used to study the aptitude to exchange electrons of various materials, both in solution and in solid state.

✓ **UV-Visible-NIR spectrophotometers**

Used for the analysis of color and concentrations in solution.

✓ **FTIR spectrophotometer**

Used for the study of the materials' composition.

✓ **Cells for spectroelectrochemistry**

Used for the spectroscopic study of the composition variations that accompany the exchange of electrons.

Applications and collaborations

Projects in collaboration with industrial partners, concluded or still ongoing:

- ✓ Development of a new electrosynthetic drug pathway (Rottapharm Biotech)
- ✓ Colorimetric determination of polysaccharides in food supplements (Erbozeta s.p.a.)
- ✓ Colorimetric determination of statins in food supplements (Biodue s.p.a.)
- ✓ Electrochemical characterization of the Fenton reaction in medical devices (Galenica Senese s.r.l.)
- ✓ Characterization of catalysts for distillation plants (Centro Ricerca Energia e Ambiente)

The group has the skills and the equipment to collaborate with companies interested in characterizing or designing new materials including composites, such as:

- nanomaterials
- magnetic materials
- functionalized and non-functionalized nanoparticles
- electrode materials
- materials for biotechnology
- drugs and/or food supplements
- bioactive molecules
- materials for photovoltaic and LED
- thin films

For more information

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Logo

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