

PhD in Materials for Sustainable Development (MaS)

Teaching Activity 2024/25

Surface and bulk properties of catalysts and electrocatalysts

- **Location:** *Seminar Room* Department of Chemical Science and Technologies
- **Calendar** 9th, 16th, 23rd, 30th May.
- **Time:** 14:30 – 16:30

Syllabus

Developing efficient and durable systems, able to compensate for intrinsic intermittency of renewable sources, is the most immediate and reliable route towards a sustainable energetic scenario after the fossil fuels phase out. The design of solid state materials for heterogeneous catalysis (methane reforming) and for application in up-and-coming devices such as new generation batteries, electrolyzers, fuel cells, solar cells, etc., is pivotal to speed up the transition towards a safer energetic scenario. Such systems rely on the specific features of single components, depending on their intrinsic nature (bulk properties) and on their interplay/interaction with the surrounding environment (surface properties).

This series of lectures is intended to provide an insightful overview onto common characterization methods for solid state materials used in heterogeneous catalysis and electrocatalysis. For each of the presented and discussed technique, application examples from recent, high-quality literature will be provided.

Contents:

9th May 2025 : *X-Ray Powder Diffraction*

16th May 2025 : *Electron Microscopy*

23rd May 2025 : *Specific surface area: Nitrogen adsorption/desorption isotherms*

30th May 2025 : *(Hints on) Electrochemical Impedance Spectroscopy*