

# Advanced Analytical Techniques

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At the San Donato Milanese Research Center the following analytical techniques are available:

## **Solid State Structural Analysis**

- X-Ray Powder Diffraction (XRD)
- Small Angle X-Ray Scattering (SAXS)
- X-Ray Photoelectron Spectroscopy (XPS)
- Thermal Analyses (DSC, DTC, TG-MS)

## **Microscopy**

- Optical Microscopy (OM)
- Scanning Electron Microscopy (SEM) with EDX and WDX analyzers
- Transmission Electron Microscopy (TEM)
- High Resolution Transmission Electron Microscopy (HRTEM)

## **Analytical Chemistry**

- CHNO and CHNS analyzers
- ICP-AES
- ICP-MS
- Ion Chromatography



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## **Spectroscopy**

- Fourier Transformed InfraRed (FT-IR)
- Near Infrared (NIR)
- Raman
- UV-Visible
- Nuclear Magnetic Resonance (NMR) liquid and solid state
- Magnetic Resonance Imaging (MRI)
- Electron paramagnetic Resonance (EPR)

## **Separation Techniques**

- Gel Permeation Chromatography (GPC)
- Liquid Chromatography (HPLC)
- High Temperature Gas Chromatography (HT-GC-MS)
- Two-Dimensional Gas Chromatography (GCxGC-MS)

## **Physical and Chemisorption Techniques**

- Textural Analysis ( $N_2$  adsorption-desorption)
- Pulsed Chemisorption
- Sorption of probe molecules on porous solids
- Acidity determination of solids by pyridine



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## On-site Survey Techniques

- Photogrammetry and 3D Laser Scanning
- Ground Penetrating Radar (Georadar, GPR)
- Differential GPS
- Portable XRF Spectrometer
- IR Thermography

## Molecular Modeling Programs

- Visualization and manipulation of structure models
- Simulation of experimental observables
- Molecular Mechanics and Dynamics
- Quantum Mechanics

