SAMBA: Spectroscopies Applied to Materials Based on Absorption

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Areas of application, instrumentation and methodologies used
Energy range: 4 - 43 keV

EXAFS spectroscopy: correlations between local structure and its magnetic or electronic properties.
Two experimental stations:

1 General purpose EXAFS station equipped with sample holders for liquids, crystalline or powdered samples, cryostats (liquid He and liquid N2), reactors with controlled atmosphere and pressure, gas dosing system, multi channel potentiostat for electrochemical cells.
Experiments may be coupled with Raman or visible-UV spectroscopies, differential scanning calorimetry and powder diffraction.

2- UHV environment with thermal evaporators, low energy electron diffraction, Auger spectrometer, ion sputtering source and the possibility to control sample temperature from -190°C to 1000°C.

Both stations are permanently equipped with high sensitivity energy resolved x-ray detectors and beam intensity monitors.

Major disciplines:
Materials and chemical sciences
Thin films and nanostructures, local structure of dopants or inclusions in magnetic nanostructures; *ex situ* and *in situ* study of metal or oxide clusters at model surfaces; lithium/sodium ion batteries, fuel cells: operando characterization of electrochemical processes. *Operando* and *ex situ* characterization of heterogeneous catalysts: activation, reaction, deactivation, nucleation-growth of nanoparticles. Chemical speciation of pollutants in environmental samples; local structure of heavy ions in metallo-proteins.