CARACTÉRISATION DES SURFACES ET DES NANOSTRUCTURES

CHARACTERIZATION OF SURFACES AND NANOSTRUCTURES

Lecturers: **Fabrice DASSENOY, Maria-Isabel DE BARROS BOUCHET**

| Lecturers : 16.0 | TC : 0.0 | PW : 8.0 | Autonomy : 0.0 | Study : 4.0 | Project : 0.0 | Language : FR

Objectives

Nanotechnologies are concerned with a very divided state of matter and an exacerbated role of the surfaces compared to the volume. The physicochemistry and the chemistry of the exposed surfaces are very important for applications. The first atomic layers present on the solids are particularly reactive in many processes.This course proposes the study of the main techniques of characterization of surfaces and of low dimensionality structures. It will be illustrated by specific applications in the field of nanotechnology and biology.

Keywords : Surfaces, Interfaces, Nanostructures, Surface analyses, Electron microscopies, Electron spectroscopies

Programme	I - Chemical analysis of the surface of solids.
	Electron spectroscopies (photoelectron, Auger), ion spectroscopy (ToF-SIMS).
	Information on surface chemical bonds.
	II- Morphological analysis of the surface at a subnanometric scale.
	Near-field microscopies (Tunneling microscopy, Atomic Force Microscopy, near-field optical microscopy) tunneling spectroscopy, measurement of interaction forces. Illustrations: (reconstruction of surfaces, single molecule, photonic crystals ...)
	III - Characterization of interfaces.
	Analytical Transmission Electron Microscopy, electron diffraction, X-ray analysis and

Learning outcomes	• To know how to refer to good characterization techniques for the study and analysis of surfaces and nanostructures • To know the basic principle of the main techniques of characterization of surfaces and nanostructures

Independent study	Objectifs :
	Méhodes :

Core texts	R. W. Cahn. , *MATERIALS SCIENCE AND TECHNOLOGY : A COMPREHENSIVE TREATMENT.* , WILEYVCH, 1994

Assessment	Two-hour test.