UE Surface Functionalisation

Niveau d'étude
Bac +5

ECTS
3 crédits

Composante
UFR Physique, Ingénierie, Terre, Environnement, Mécanique (PhITEM)

Période de l'année
Automne (sept. à dec./janv.)

Diplômes intégrant cet élément

- Master Nanosciences et nanotechnologies

Langue(s) d'enseignement: Anglais

Ouvert aux étudiants en échange: Oui

Code d'export Apogée: PAX9NCAM

Présentation

Description

Goal

The applications of surface functionalization are multiple and cover large fields. The aim of this course is to focus on two challenging applications: the conception of biosensors and (photo)electrocatalysis. The course is structured into two modules differentiated by the types of application.

1. Surface functionalization for the fabrication of biosensors (12h)

- Functionalization and electrofunctionalization (AS)
- Applications to olfactory biosensors and biomimetic electronic noses (YHB)
- Application to the conception of cell chips and detection of bacteria (YR)
- Biomolecular assemblies and self-organization of biomolecules on surfaces (DG, PHE)

2. (Photo)electrocatalysis applications (12h)

Informations non contractuelles.
Dernière mise à jour le 30 juin 2026

- Introduction to (photo)electrocatalysis (VA)
- Molecular engineering of nanomaterials for (bio)electrocatalysis in energy-related sytems (AL)
- Surface functionalization for photo(electro)catalysis: from photovoltaics to solar water splitting and CO2 conversion (BR, DA)
- Micro/nanostructure in electrocatalysis (PC)

The sessions will be given by a series of experts in the field. The teachers will coordinates to focus especially on the most essential aspect of functionalization, such as grafting stability, mastering distance between graft and surface, ensuring optimal electronic transfer, passivation, ecofriendliness. Particularly for biosensors, the surface chemistry should allow to maintain the integrity of the grafted biomolecules or biological objects.

Part of the sessions will be devoted to critical analysis of some selected literature papers in detail and sorting out the functionalization strategies and its consequences.

Heures d'enseignement

CMTD	Cours magistral - Travaux dirigés	24h

Période : Semestre 9

Infos pratiques

Lieu(x) ville

Grenoble

Campus

Grenoble - Domaine universitaire

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