UE Molecular nanomaterials

ECTS
6 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: PAX9NCAA

Présentation

Description

The lecturers will browse the different aspects of the synthesis of bulk molecular materials and bottom-up strategies towards the corresponding molecular nanoobjects. This approach is based on the use of well-defined precursors and a good control of the conditions in which they react together in order to master the topology/dimensionality, size/nuclearity, shape and dispersity of the bulk materials and nanoobjects. A special attention will be paid to their characterization using single-crystal X-ray diffraction and to their magnetic and electrochemical properties.

Objectifs

Molecular Magnetism

Prerequisites, a quick reminder…
Interacting spins: The Kahn's model

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

Multifunctional Molecule-based Magnets
Processing of Molecule-based Magnets Photoresponsive molecular systems

1. Based on photoinduced energy transfer
2. Based on charge separation state
3. Application in redox photocatalysis
4. Application in molecularsensor
5. Based on photochromic units
Single-Crystal X-Ray diffraction

1. Crystal
2. RX-materials Interactions
3. Diffracted intensity
4. Apllication: structure resolution

Heures d'enseignement

CMTD	Cours magistral - Travaux dirigés	36h
TP	TP	4h

Pré-requis recommandés

Basically, the prerequisites are those of M1 Nanochemistry courses in particular Supramolecular and Coordination Chemistry and Molecular Photophysics:

- Synthesis: Basis in coordination and supramolecular chemistry including ligand design and synthesis, thermodynamic of complexes.
- Properties and techniques: oxido-reduction properties, optical properties of complexes (Tanabe-Sugano diagrams, luminescence properties), magnetic properties of the single ion (Van Vleck and Curie laws, Zero-Field Splitting, Spin Cross-Over), knowledge on powder X-ray diffraction

Période : Semestre 9

Infos pratiques

Lieu(x) ville

Grenoble

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Campus

Grenoble - Domaine universitaire

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