Matérials

Presentation

Prerequisites

General chemistry

Learning objectives

This module will enable students to broaden their physical chemistry skills and knowledge in the field of materials science. The principles of synthesis (polymerization, sol gel, etc ...) and the characterization of the materials will also be treated.

Description of the programme

- Theoretical aspect of the chemical reactions involved.

- Materials science and physical and chemical characterization: highlight on the structure-property relationship.

- Global vision of the potential of materials: From a domestic utility to an application in high technology.

Generic central skills and knowledge targeted in the discipline

Theoretical aspects:

Structure of solids and defects

Major families of materials will be studied: organic polymers, inorganic and ceramic materials, hybrid organic-inorganic materials and metals.

Organic polymers: polycondensation, chain polymerization. Characterization. Mechanical properties. From oil to polymer

Inorganic materials, ceramics, glasses: Chemical synthesis, physical and chemical synthesis. The sol gel process.

Inorganic-organic hybrid materials. Synthesis. Characterization. Structure-property relationship. Fuel cells.

Metals via materials science

Practical teachings:

Synthesis of an adhesive

Synthesis of an organic polymer

Synthesis of a functionalized hybrid material

How knowledge is tested

Evaluation	Type	**Duration**	**% final note**
Final test	Written	1 h	30
Continuous examination	Report and MCQ	-	70

Bibliography

Handout with holes

Teaching team

Damien HERAULT

Innocenzo De Riggi

Total des heures		**30h**
CM	Master class	16h
TD	Directed work	6h
TP	Practical work	8h

Useful info

Name responsible for EU

Lead Instructor
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