UE Polymers 1

ECTS
6 credits

Component
UFR Chimie-Biologie

Semester
Automne

- **Teaching language(s):** English
- **Open to exchange students:** Yes
- **Code d'export Apogée:** YACH7U14

Presentation

Description

This course gives an overview of the polymer field from the synthesis of polymers to characterization, properties, and applications of synthetic and natural polymers. All major polymerization methods, their reaction mechanisms and kinetic aspects are considered: step growth polymerization, chain growth polymerization with ionic and radical variations, insertion polymerization. A lecture portion is integrated with a laboratory component, in which experiments are conducted that are directly connected to the class work. Analysis of polymer solution properties and caracterization techniques are presented : thermodynamics, polymer/solvent interactions, average molecular weight determination via osmometry, ligth scattering, viscosimetry and SEC.

Course parts

UE Polymers 1 - TP	Practical work (TP)	16h
UE Polymers 1 - TD	Tutorials (TD)	12h
UE Polymers 1 - CM	Lectures (CM)	22h

Period : Semester 7

Skills

Basic knowledge of the main polymerization methods, properties of polymers and their characterization methods.

Bibliography

Details:
I. Introduction : definition, history, classification and properties of polymers, economic aspects, molar masses
II. Synthetic polymers : chain polymerizations, step growth polymerizations, polymerization processes, synthesis of thermosetting polymers and elastomers
III. Biopolymers : classification, properties, methods for their chemical modification and applications
IV. Polymer characterisation - molar masses: light scattering, viscometry, gel permeation chromatography, osmometry
V. Chain dimensions, structure and thermal transitions
VI. Thermodynamic of polymer solutions, solubility behaviour
VII. Introduction to rheology and mechanical properties of polymeric materials

Useful info

Contacts

Program director

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Place

Grenoble

Campus

Grenoble - University campus