LU3Ci003: Introduction to polymers

Person in charge

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1. Prospectus

Teaching hours: lectures 12 h, tutorial classes 10 h, laboratory experiments 8 h Number of credits: 3 ECTS

Grading /100: in-class exam /75 (integral in-class exam), laboratory /25 (including a practical exam; no more than one absence is allowed to take the practical exam)

Paths: mono-disciplinary / bi-disciplinary / top-minor

Period of teaching in English: semester S6 (period P2) of the 3rd-year Bachelor in Chemistry

2. Pedagogic aims of the course

a. Objectives

This course aims to give students the basics in chemistry and physico-chemistry of polymers. The aim is to introduce them to the synthesis and characterization of polymers and to take an interest in the relationship between structure and properties.

The teaching will include an approach of the major synthetic methods (polycondensation / polyaddition and polymerization in chain) and methods of characterization in solution (in particular the analysis of the average molar masses and distributions). Structures in the solid state (amorphous, crystalline or semi-crystalline) as well as the thermal and mechanical properties will be presented.

b. Topics covered

Polymer structure.

Polymerization degree / average molar masses and distributions. Characterization of macromolecules in solution.

Structure and properties of solid-state polymers.

Macromolecular synthesis: polyaddition / polycondensation, chain polymerizations of ethylenic monomers.

3. Pre-requisites

Basics of organic chemistry (structural aspects, stereochemistry, reactivities of main organic functions) and chemical kinetics.