MSE-437

Polymer chemistry and macromolecular engineering

Klok Harm-Anton

Cursus	Sem.	Type
Chimiste	MA2, MA4	Opt.
Ing.-chim.	MA2, MA4	Opt.
Materials Science and Engineering	MA2, MA4	Opt.

Language of teaching	English
Credits	3
Session	Summer
Semester	Spring
Exam	During the semester
Workload	90h
Weeks	14
Hours	**3 weekly**
Courses	2 weekly
Exercises	1 weekly
Number of positions	

Summary

Know modern methods of polymer synthesis. Understand how parameters, which determine polymer structure and properties, such as molecular weight, molecular weight distribution, topology, microstructure can be controlled by proper choice of polymerization method and optimization of reaction condition

Content

- Introduction: Polymer structure, molecular weight and properties
- Step polymerization
- Radical chain polymerization (free radical polymerization, controlled radical polymerization)
- Emulsion polymerization
- Ionic chain polymerization (anionic and cationic polymerization)
- Chain copolymerization
- Ring-opening polymerization

Keywords

Polymer chemistry
chain polymerization
step polymerization

Learning Prerequisites

Recommended courses

General chemistry, Inorganic chemistry, Organic and polymer chemistry

Learning Outcomes

By the end of the course, the student must be able to:

- Discuss the main types of polymerization techniques
- Propose synthetic strategies to prepare specific synthetic polymers
- Specify the influence of key reaction parameters on polymer properties

Transversal skills

- Assess progress against the plan, and adapt the plan as appropriate.
- Make an oral presentation.
- Write a scientific or technical report.

Assessment methods

Continuous assessment

Resources

Ressources en bibliothèque

- Principles of polymerization / Odian
- Polymer Chemistry / Lodge

Moodle Link

- https://go.epfl.ch/MSE-437