

MSE-703

Science and technology of UV-induced polymerization

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Cursus	Sem.	Type
Advanced Manufacturing		Opt.
Materials Science and Engineering		Opt.

Language of teaching	English
Credits	1
Session	
Exam	Term paper
Workload	30h
Hours	14
Lecture	14
Number of positions	

Frequency

Every year

Remark

Ne sera pas enseigné durant l'année académique 2023-2024

Summary

The course presents the main classes of photopolymers and key factors which control photopolymerization. It explains how to select the right formulation and optimize processes for a given application. Standard and novel characterization methods, new materials and new applications are also presented.

Content

1. Introduction to radiation processing
2. Fundamentals of free-radical systems
3. Components of photocurable formulations: photoinitiators, monomers, additives
4. Analytical methods: state of the art and new developments
5. Structure-property relations in UV curable polymers
6. Advances in UV-induced polymerization research
7. Application to UV inks and coatings, nanostructures and devices

Learning Prerequisites**Recommended courses**

Polymer science, organic chemistry

Assessment methods

The course provides 1 ECTS, based on a written report (maximum 10 pages) on a topic relevant to UV polymers. The report should synthesize three technical papers A, B and C from open scientific literature and develop a short case study (for example using equation from paper A and data from paper B to model results from paper C, or designing a process method (formulation, UV intensity, time) using inputs from the 3 papers).

Resources**Notes/Handbook**

A copy of the course slides is provided at the start of the course.

Moodle Link

- <https://go.epfl.ch/MSE-703>