MSE-703

Science and technology of UV-induced polymerization

Leterrier Yves, Nouzille Eric Jacques, Sangermano Marco

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

Language of teaching	English
Credits	1
Session	
Exam	Multiple
Workload	30h
Hours	**14**
Courses	14
Number of positions	

Frequency

Every year

Remark

Block course

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

Note

Program relevant for students in materials science, chemistry and micro-engineering
(part of the course on 'selected topics in polymer science')

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.