

POLYMER CHEMISTRY

1.1. Identification

University:	Kungliga Tekniska Högskolan (Stockholm)											
School:	School of Chemical Science and Technology											
Course:	Polymer Chemistry											
ECTS:	7.5											
Semester:	<i>Winter</i>				X	<i>Summer</i>						
Category	<i>Fundamental course</i>				X	<i>Specialisation course</i>						
Module	<i>MFI</i>		<i>MFII</i>	X	<i>MFIII</i>		<i>MSI</i>		<i>MSII</i>		<i>MSIII</i>	
Teachers:	Minna Hakkarainen											
Language:	<i>English</i>	X	<i>Italian</i>		<i>Swedish</i>	X	<i>Spanish</i>					

1.2. Learning-outcomes

- knowledge about the fundamentals of polymer synthesis
- knowledge about the modification processes of polymers

1.3. Competencies

▪ General

- to have critical understanding of technical and scientific tools
- to work and manage teams
- communication skills (both written and oral)
- to work in an international context

▪ Specific

- to look for and determine the kinetics and thermodynamics of polymerization reactions.
- to understand and implement different processes of polymer modification
- to analyse the influence of phenomena such as catalysis, chain transfer, degradation or stabilization of polymers.

1.4. Contents

Mechanisms, kinetics and thermodynamics of polymerization reactions and their technical formation. Processes in gas phase, bulk phase (melt and solid phase), solution, emulsion and suspension, use of homogeneous and heterogeneous catalysis, different initiation, chain transfer and terminal reactions, isolation and processing of the products as well as modification, oxidation, degradation and stabilization of polymers.

Different polymerisation processes regarding chemical mechanisms and different steps, by-reactions and modifications which can occur are compared.

1.5. Teaching Methodology

- Lecture sessions
- Practical sessions: "cooperative work" for solving problems
- laboratory sessions

1.6. Evaluation

- written exams
- oral evaluation of the problems solved by "cooperative work"
- oral evaluation of laboratory work

1.7. Bibliography

- Woodward, A.E., "Atlas of Polymer Morphology" Hanser Publishers
- Boyd, Phillips, "The science of Polymer Science" Cambridge Ed.