



## SUBJECT DATASHEET

<b>Semester:</b>	2010/11/2
<b>Subject:</b>	Chemistry and physics of polymers
<b>Code:</b>	VEMKOK4112P
<b>Responsible department:</b>	Department of Organic Chemistry
<b>Responsible department code:</b>	MKOK
<b>Responsible lecturer:</b>	dr. József Kaizer

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### Educational objectives:

Educational Objectives: Preparation, characterization, physical and mechanical properties, and structure-property relations of polymers.

### Detailed content of the subject:

Contents: Week: 1. Historical Background, Birth of a concept 2. Classification, Nomenclature 3. Average molar masses and distributions, Size and shape 4. Polymerization reactions 5. Step-growth polymerization (Carothers equation, Ring formation) 6. Step-growth polymerization (Kinetics) 7. Addition (chain) polymerization 8. Free radical addition (chain) polymerization (Initiators, chain growth, termination, kinetics) 9. Polymerization processes 10. Ionic polymerization, Kationic polymerization (Propagation, Termination, General kinetic scheme) 11. Anionic polymerization (Living polymers, Kinetics and molar mass distribution in living systems) 12. Kationic and anionic ring opening polymerization 13. Polymer stereochemistry, Ziegler Natta catalyst (Nature of the catalyst, Mechanisms) 14. Metathesis 15. Copolymerization

### Requirements:

Examination Requirements and Questions: The written test for the students involves the main areas of basic polymer chemistry such as preparation, characterization, physical and mechanical properties, and culminates in a coverage of structure-property relations. The student has to reach a 50% result to get passed the course. The individual questions can be viewed on previous exam sheets. On every occasion new questions are posed.

### Required and suggested references:

1. R.J. Hunter, Foundations of Colloid Science Vol. 1., Oxford University Press: New York, 1989. 2. Varga József : Makromolekulák kémiája, Tankönyvkiadó, Budapest 1990. 3. Varga József, Műanyagok fizikája, Tankönyvkiadó Budapest 1984.