



KF2130 Polymer Chemistry 7.5 credits

Polymerkemi

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for KF2130 valid from Autumn 2010

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Chemical Science and Engineering, Chemistry and Chemical Engineering

Specific prerequisites

At least 150 credits from grades 1, 2 and 3 of which at least 110 credits from years 1 and 2, and bachelor's work must be completed, within a programme that includes: 75 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics and 6 university credits (hp) in computer science or corresponding.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After completing the course the student should be able to

- Explain the general reaction course and reaction mechanism for step growth-, chain and ring-opening polymerization including radical-, coordination-, ion-, and copolymerization
- Describe the principals of bulk and solution, interface polymerization, suspension and emulsion polymerization
- Suggest and motivate choices of polymerization technique considering the monomer structure and describe properties of the manufactured product. Suggest measures to control the molecular weight and the rate of polymerization
- Compare and value different polymerization techniques
- Calculate the degree of polymerization, average molecular weight, average functionality, gel point, kinetic chain length, copolymerization composition etc.
- Practically perform different types of polymerizations
- Present and evaluate a laboratory assignment orally and in writing

Course contents

The lectures discuss polymerization mechanisms, kinetics and thermodynamics, polymerization techniques such as gas phase, bulk, solution, emulsion- and suspension polymerization. In connection with this, the use and effects of homogenous and heterogeneous catalysis, different initiation-, chain transfer- and termination reactions and polymer modification reactions are in focus. The lectures are closely related to the laboratory work and to class exercises.

Course literature

Introduction to Polymer Science and Chemistry: A Problem Solving Approach by Manas Chanda

Examination

- ÖVN1 - Practical Course, 0.8 credits, grading scale: P, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Course, 3.7 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Written examination, 3,0 cr, grade scale: A, B, C, D, E, FX, F

Completed laboratory course including written and oral report presentation, 3,7 cr, grade scale: P, F

Completed class exercises, 0,8 cr, grade scale: P, F

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.