

Synthesis of Inorganic and Organic Materials

Module assigned to 1st semester

Identification Code	2288870120
ECTS-Points	4
Credit Hours	2
Language	english
Length of the Module	1 semester
Date and Capacity	winter term 60 students
Responsible Lecturer	Dr. Ulrich Ziener
Further Lecturer	Dr. Björn Bredenkötter, Prof. Dr. Dirk Volkmer, Dr. Ulrich Ziener
Study Programme	Master degree in Advanced Materials Master degree in Energy Science and Technology compulsory
Prerequisites	BSc degree
Study Objectives	The students should - understand the fundamentals of general chemistry and chemical synthesis with respect to the preparation of organic polymeric and inorganic materials
Module Contents	First part: Topics of the course are the basics in Organic Chemistry (nomenclature, functional groups, reactivity) as well as some fundamental applications of standard analytical methods (e.g. UV-, IR- and NMR-spectroscopy, HPLC and mass spectrometry). Second part: fundamental terms of polymer chemistry, chemical structure of polymers, molar mass and its distribution, configuration and stereoisomers, step- and chain-growth polymerisation, anionic polymerisation, insertion polymerisation, metathesis polymerisation, free radical polymerisation, polymerisation techniques (solution, suspension, emulsion), copolymerisations, polyaddition, polycondensation, networks, technical polymers.
Literature	Handouts - J. R. Dean, A. M. Jones, D. Holmes, R. Reed, J. Weyers, A. Jones: <i>Practical Skills in Chemistry</i> PEARSON - and basic textbooks of Organic Chemistry. - -H.-G. Elias: <i>An Introduction to Polymer Science</i> VCH Weinheim 1997, chapters 1-4. - John R. Dean: <i>Practical Skills in Chemistry</i> Prentice Hall 2002.
Teaching Methods	Synthesis of Organic and Inorganic Materials (L), 3 h/week

Estimation of working load	40 h lecture (presence) 64 h preparation and postprocessing lecture 16 h exam preparation Total: 120 h
Examinations	written examination
Grade Composition	exam result
Usability	MSc course of studies Energy Science and Technology