

Syllabus

for course at advanced level

Porous Materials
Porösa material

**7.5 Higher Education
Credits**
7.5 ECTS credits

Course code:	KZ8011
Valid from:	Spring 2015
Date of approval:	2023-10-27
Department	Department of Materials and Environmental Chemistry
Main field:	Chemistry
Specialisation:	A1F - Second cycle, has second-cycle course/s as entry requirements

Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University.

Prerequisites and special admittance requirements

Course structure

Examination code	Name	Higher Education Credits
MOM1	Theory	4
MOM2	Project Work	3.5

Course content

a. The course gives a survey of the chemistry of various porous materials, focusing on their structures and properties, including the most recent development within the field. Basic theory and laboratory exercises, using various instruments and methods for characterization of the materials are comprised. Furthermore, chemical composition and structure of various types of porous materials is described, their composition, properties and different synthesis methods for making the materials. The concept of reticular chemistry is introduced for systematic design of materials with specific desirable properties. The project work comprises synthesis of porous materials and characterization of the substances so obtained, using different techniques. The techniques used are X-ray powder diffraction (i.e. of microcrystals), scanning electron microscopy (SEM) and energy dispersive X-ray spectroscopy (EDS), transmission electron microscopy (TEM), thermal analysis, gas adsorption and various spectroscopic methods of analysis, especially FT-IR and solid-state NMR..

b. The course includes the following two elements:

1. Theory 4 higher education credits
2. Project work 3.5 higher education credits.

Learning outcomes

It is expected that the student after taking the course will be able to:

- Describe the synthesis of various types of porous materials, and the most important synthesis parameters.
- Categorize zeolite structures and describe how these are built up of smaller elements.
- Describe how structure, chemical content and defects of porous materials affect their properties, and be acquainted with important applications of porous materials.
- Give an account of different methods and instruments that can be used for characterizing the structure and properties of porous materials.

Education

The education consists of lectures and project work..

Participation in the project work and group education associated with this is compulsory. After consultation with the relevant teacher, an examiner may rule that a student is not obliged to participate in certain compulsory education, if there are special grounds for this.

Forms of examination

a. Measurement of knowledge for element X takes place through:

- Written and/or oral examination

b. Grading is carried out according to a 7-point scale related to learning objectives:

A = Excellent, B = Very Good, C = Good, D = Satisfactory,

E = Sufficient Fx = Fail F = Fail.

c. Grading criteria for the course will be distributed at the start of the course.

d. A minimum grade of E is required to pass the course, together with:

- Completion of the project work, followed by its presentation and award of a "Sufficient" grade

e. Students who fail to achieve a pass grade in an ordinary examination have the right to take at least further four examinations, as long as the course is given. The term "examination" here is used to denote also other compulsory elements of the course. Students who have achieved a pass grade on an examination may not retake this examination in order to attempt to achieve a higher grade. Students who have failed to reach a pass grade on two occasions have the right to request that a different teacher be appointed to set the grade of the course. A request for such appointment must be sent to the departmental board.

Interim

Students may request that the examination is carried out in accordance with this syllabus even after it has ceased to apply. This right is limited, however, to a maximum of three occasions during a two-year-period after the end of giving the course. A request for such examination must be sent to the departmental board.

Required reading

Course literature is decided by the departmental board and is described in an appendix to the syllabus.