KD1080 Chemical Dynamics 6.0 credits

Kemisk dynamik

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

Establishment

Course syllabus for KD1080 valid from Spring 2019

Grading scale

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

Education cycle

First cycle

Main field of study

Chemistry and Chemical Engineering, Technology

Specific prerequisites

Completed upper secondary education including documented proficiency in English corresponding to English A. For students who received/will receive their final school grades after 31 December 2009, there is an additional entry requirement for mathematics as follows: documented proficiency in mathematics corresponding to Mathematics A.

And the specific requirements of mathematics, physics and chemistry corresponding to Mathematics E, Physics B and Chemistry A.

Language of instruction

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

Intended learning outcomes

After passing the exam, the student should be able to

• Analytically formulate, and analytically or numerically solve rate expressions in non-complex reaction kinetics

• Analyze experimental kinetic data with regard to reaction order and temperature dependence parameters.

• Explain the relations and links between chemical reaction rates and thermodynamic equilibrium constants

• Explain reaction rate dependencies on parameters like temperature, pressure, ionic strength in solution, etc.

• Account for the molecularly related steps and events that govern thermal or photochemical reaction kinetics or transport rates.

Also, the student should at that stage be able to suggest procedures and strategies for

• Solving and analyzing more complex reaction kinetic and transport problems through numerical computer algorithms, through commercial or freeware computer programs.

and

• Available experimental methodology for investigating fast reaction kinetics.

These latter aspects are illustrated also in the lab part of this course.

Course contents

- Molecular dynamics in general
- Kinetic theory of gases
- Diffusion and other transport phenomena
- Chemical reaction kinetics, molecular reaction mechanisms
- Photophysical processes
- Dynamical processes in biological systems

Course literature

Atkins and de Paula
Atkins' Physical Chemistry, 9th

Oxford University Press 2010
ISBN-13: 978-0-19-954337-3

Examination

- TEN1 - Written exam, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 1.5 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

1. Written examination 4,5 credits
2. Laboratory work 1,5 credit

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.