KD1290 Chemical Analysis 8.5 credits

Kemisk analys

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

Establishment

Course syllabus for KD1290 valid from Spring 2019

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Completion of upper-secondary school before 1 July 2011 and adult education at upper-secondary level before 1 July 2012

Specific entry requirements: mathematics E, physics B and chemistry A. The grade Passed or 3 in each of the subjects is required.

Completion of upper-secondary school from 1 July 2011 and adult education at upper-secondary level from 1 July 2012 (Gy2011)

Specific entry requirements: Physics 2, Chemistry 1 and Mathematics 4. A pass in each of the subjects is the lowest acceptable grade.

Language of instruction

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

Intended learning outcomes

On completion of the course, the student should be able to:

1. Calculate different types of chemical equilibrium equations with appropriate approximations and predict how the equilibrium concept can be utilized to influence a process (TEN1).
2. Independently plan and perform wet chemical work in accordance with standard procedures for safe handling of chemicals and apply the equilibrium concept for analysis and separation (LAB1).
3. Identify natural forms of our most common elements in soil, water and air, and based on the principles of equilibrium describe flows and circles in nature as well as reflect on the consequences of disturbances of the system's equilibrium from the perspective of sustainable development (TEN1, TEN2).
4. Describe and use spectroscopy, chromatography and potentiometry as analytical techniques, be able to analyze results and choose appropriate analysis method for a given problem (TEN2, LAB2)
5. Compile, describe and discuss experimental results in a written report (FÄL1).

Course contents

Chemical Analysis is both about theoretically analyzing the driving forces in nature, i.e. how the strive towards equilibrium gives rise to chemical reactions, and how we practically can use instrumental techniques and analytical methodology for analysis. In other words, chemical equilibrium, inorganic reaction theory and analytical chemistry are linked in the course under the context of natural circles, environmental chemistry and sustainable development. The course focuses on equilibrium calculations of acid / base, gas, solubility, complex and redox reactions and practical analysis work. Lectures aim to support these elements with underlying theory. The student is trained in wet chemical methodology as well as the usage and calibration of instrumental analytical techniques. The course content is applied by sampling, preparation and chemical analysis of soil samples collected during an excursion. Particular emphasis is placed on how data is processed and described in a written report form.

Course literature

1. Harris ”Exploring Chemical Analysis”

2. Burrows, Holman, Parsons, Pilling, Chemistry3, Oxford,

3. Exempelsamling Kemisk Jämvikt

4. Handledning i praktisk jämviktslära

Examination

- FÄL1 - Excursion, 1.0 credits, grading scale: P, F
- TEN2 - Examination Chemical Analysis, 2.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination in Chemical Equilibria, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB2 - Laboratory Exercises in Analytical Techniques, 1.0 credits, grading scale: P, F
- LAB1 - Laboratory Exercises in Chemical Equilibria, 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.

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.