LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Allmän och organisk kemi
General and Organic Chemistry

KOKA20, 7,5 credits, G1 (First Cycle)

Valid for: 2023/24
Faculty: Faculty of Engineering, LTH
Decided by: PLED B/K
Date of Decision: 2023-04-18

General Information

Main field: Technology.
Compulsory for: BME1
Language of instruction: The course will be given in Swedish

Aim

To provide a basic understanding of and knowledge about chemical processes and phenomena. Fundamental understanding of structure and reactivity of organic and inorganic compounds and knowledge about the principles of chemical formulae and important chemical concepts in the Swedish and the English language.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- understand the meaning of chemical formulae and reaction equations for both organic and inorganic compounds.
- have knowledge about the most common types of organic compounds.
- be familiar with, be able to describe, explain, and use fundamental chemical concepts.
- be familiar with and be able to describe qualitatively and use simple theoretical approaches to chemical bonding.
- be able to explain the meaning of thermodynamic functions and simple thermodynamic relations.
- have knowledge about the structure of polymers and biomolecules.

Competences and skills

For a passing grade the student must

- be able to set up and actively use reaction equations for describing chemical reactions.
- be able to describe qualitatively intermolecular and intramolecular forces in chemical substances.
- be able to draw up and solve chemical equilibrium problems.
- be able to describe electrochemical cells and analyse the processes in electrochemical cells, as well as calculate cellpotentials.
- be able to use basic integrated rate laws and to calculate data related to these.

Judgement and approach
For a passing grade the student must

- be able to present chemical calculations using correct units and appropriate accuracy in a logical and relevant way.
- be able to collect, present and evaluate results from practical experiments.

Contents

- Fundamental chemical concepts.
- The structure of atoms and the periodic table.
- Chemical formulae, reactions and stoichiometry
- Chemical bonding and the geometry of molecules.
- Intermolecular forces: dispersion forces, hydrogen bonding, dipole-dipole and ion-dipole interactions.
- Fundamental organic chemistry with focus on structure.
- Chemical thermodynamics: Enthalpy, entropy, internal energy, and free energy and their interrelations. Standard enthalpy of formation and reaction.
- Chemical equilibrium with basic numerical applications.
- Electrochemistry: redox-processes and electrochemical cells.
- Chemical kinetics: the rate constant and its temperature dependence and integrated rate laws.

The student works actively with problem solving during the course in order to reach the learning outcomes described above. Skills and abilities in the professional use of scientific and chemical therminology are promoted by the use of standard English literature.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: Written exam, participation in laboratory seminar. The final exam forms the basis for the grade.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts
Code: 0115. **Name:** General and Organic Chemistry.
Credits: 7,5. **Grading scale:** TH. **Assessment:** Written examination.
Code: 0215. **Name:** Laboratory Exercises.
Credits: 0. **Grading scale:** UG. **Assessment:** Participation is mandatory, passed written report.

Admission

The number of participants is limited to: No
The course overlaps following course/s: TEK285, KOKA01

Reading list

- Burrows, A; Holman, J; Lancaster, S; Overton, T; Parsons, A; Pilling, G; Price, G: Chemistry 3, Introducing Inorganic, Organic and Physical Chemistry. Oxford University Press, 2021.

Contact and other information

Course coordinator: Martin Ek, martin.ek@chem.lu.se
Course homepage: http://www.kilu.lu.se/cas/education/undergraduate_education/