Course syllabus

Allmän kemi
General Chemistry

KOOA15, 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: B1, K1
Language of instruction: The course will be given in Swedish

Aim

The course shall give a basic understanding of and knowledge about chemical processes as well as give a basis for continued studies in chemistry.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- be able to explain and use thermodynamical data and expressions and to use the relationship between them.
- be able to understand and apply the concept of chemical equilibria
- be able to derive and interpret reaction mechanisms, formulate rate laws and relate the rate of a chemical process to the temperature

Competences and skills
For a passing grade the student must

- be able to solve basic thermodynamic problems and interpret the results
- be able to analyse 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 phenomena are discussed and explained using connections to everyday applications. The following topics will be covered:

- General introduction to enthalpy, entropy, internal energy and free energy.
- The laws of thermodynamics.
- Standard enthalpy of formation and reaction.
- Calorimetry.
- Chemical equilibrium
- Electrochemistry including redox-processes and electrochemical cells.
- Corrosion
- Chemical kinetics, the rate constant and its temperature dependence, instantaneous rate method, integrated rate laws, activation energy, chain reactions, reaction mechanisms.

Active work with solving problems plays an important role in the course.

The literature is in English and should be regarded as an introduction to the English language in the field of natural sciences.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: Continuous examination. Passed laboratory exercises and hand-in exercises required. Passed laboratory exercises, hand-in exercises and tests will give the grade 3. Failed continuous examination demands written final exam. For higher grade than 3, written final exam is necessary.

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:** Compulsory Exercises and Tests.
Credits: 5,5. **Grading scale:** TH. **Assessment:** Continuous examination. Passed hand-in exercises are required. Passed tests and hand-in exercises will give the grade 3. Failed continuous examination demands written final exam. For higher grade than 3, written final exam is necessary. **Contents:** Compulsory hand-in exercises and tests.
Code: 0215. **Name:** Laboratory Assignments.
Credits: 2. **Grading scale:** UG. **Assessment:** Active participation in the laboratory assignments. Approved reports. **Contents:** Compulsory laboratory assignments related to the course content.

Admission

Assumed prior knowledge: KOOA20 Introductory Chemistry
The number of participants is limited to: No
The course overlaps following course/s: KOO080, KOO081, KOOA01, KOOA05, KOO101, KASA01

Reading list

- Atkins, Jones, Laverman, Patterson, Young: Chemical Principles: The Quest for Insight, 8:e upplagan. Macmillan Learning, 2023, ISBN: 9781319498498.
- Aylward, G & Findlay, T: SI Chemical Data, 7:e upplagan. Wiley , 2014, ISBN: 9780730302469.
- Laboratory manual.

Contact and other information

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