Course Specifications
Valid as from the academic year 2017-2018

Electrochemistry (E070900)

Course specifications

Lecturers in academic year 2017-2018
Strubbe, Katrien
WE06 lecturer-in-charge

Course offerings in academic year 2017-2018
A (semester 2)

Offered in the following programmes in 2017-2018

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<tr>
<td>Master of Science in Chemical Engineering</td>
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<td>A</td>
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Teaching languages
Dutch

Keywords
ionic solutions, electrochemical equilibrium, electrode kinetics, corrosion, batteries

Position of the course
To gain insight in the behaviour of electrolyte solutions, the position of chemical equilibria in which ions are involved, equilibrium potentials at electrodes.
To gain insight in the mechanism of corrosion processes and the action of batteries and fuel cells

Contents
- Ionic solutions: Thermodynamic properties of ions in solution, Arrhenius theory, Debye-Hückel theory, Equilibria in ionic solutions
- Equilibrium electrochemistry: Reversible electrodes, Equilibrium potential of an electrochemical cell, Standard electrode potentials,
- Corrosion and corrosion protection,
- Batteries and fuel cells

Initial competences
Physical chemistry: chemical thermodynamics

Final competences
1. To have insight in the behaviour of electrolyte solutions and know the current models and theories that explain this behavior
2. To have insight in the concepts of electrochemical equilibrium at electrodes and the factors that influence this equilibrium
3. To have insight in principles of corrosion and the different methods for protection.
4. To have knowledge of the most common batteries and their working action.
5. To have knowledge of the principles of fuel cells, their advantages and some practical problems concerning their applications.

Conditions for credit contract
Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract
This course unit cannot be taken via an exam contract

Teaching methods
Lecture, seminar

(Approved)
Learning materials and price
syllabus (Dutch) on Minerva
presentations, documents on Minerva

References
• "Atkins' Physical Chemistry," P. Atkins, J. De Paula, uitg. Oxford University Press,
• "Electrochemistry" H. Hamann, A. Hamnett, W. Vielstich, Wiley-VCH, Weinheim
  (1998)

Course content-related study coaching
  possibility for asking questions by e-mail or after making an appointment

Evaluation methods
  end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period
  Written examination with open questions, oral examination

Examination methods in case of periodic evaluation during the second examination period
  Oral examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
  not applicable

Extra information on the examination methods

Calculation of the examination mark
  the points on different questions are added up

Facilities for Working Students
  make an appointment before the start of the semester