Electrochemistry (E070900)

Course Specifications
Valid in the academic year 2019-2020

Course size (nominal values; actual values may depend on programme)

<table>
<thead>
<tr>
<th>Credits</th>
<th>Study time 90 h</th>
<th>Contact hrs 30.0 h</th>
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Course offerings and teaching methods in academic year 2019-2020

A (semester 2) Dutch
lecture 15.0 h
seminar 15.0 h

Lecturers in academic year 2019-2020

Strubbe, Katrien WE06 lecturer-in-charge

Offered in the following programmes in 2019-2020

| Master of Science in Chemical Engineering | 3 | A |
| Master of Science in Chemical Engineering | 3 | A |

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: Reversibele 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 the electronic learning environment
  presentations, documents on the electronic learning environment
References
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
  partly oral closed-book exam, with written preparation, partly
  closed book exam, exercises: open book exam
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

(Approved)