

Electrochemistry (E070900)

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

Credits 3.0 Study time 90 h Contact hrs 30.0 h

Course offerings in academic year 2018-2019

A (semester 2) Dutch

Lecturers in academic year 2018-2019

Strubbe, Katrien WE06 lecturer-in-charge

Offered in the following programmes in 2018-2019

	crdts	offering
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: 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

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, Oxford (2002)
- "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

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