Course Specifications
Valid in the academic year 2019-2020

Physical Chemistry II: Electrochemistry, Chemical Kinetics (C003079)

Course size (nominal values; actual values may depend on programme)
Credits 5.0 Study time 150 h Contact hrs 72.0 h

Course offerings and teaching methods in academic year 2019-2020
A (semester 1) Dutch lecture 22.5 h
seminar: coached exercises 10.0 h

Lecturers in academic year 2019-2020
Strubbe, Katrien WE06 lecturer-in-charge

Offered in the following programmes in 2019-2020 crdts offering
Bachelor of Science in Chemistry 5 A

Teaching languages
Dutch

Keywords
Ionic solutions, electrode potential, electrochemical equilibrium, chemical kinetics, rate of reaction, rate law, reaction mechanism

Position of the course
This course contains two parts.
Part 1 discusses the basic concepts of chemical kinetics
Part 2 follows on the course “Physical chemistry I” and discusses the thermodynamics of ionic solutions and equilibrium in the case charged particles are involved.

Contents
• Empirical chemical kinetics
• Chemical kinetics and reaction mechanism,
• Theories on electrolyte solutions
• Influence of ionic strength upon equilibria in ionic solutions
• Reversible electrodes, equilibrium potential of an electrochemical cell
• Standard electrode potentials
• Corrosion: principles
• Rate of electrode reactions

Initial competences
have seen the course "Physical Chemistry: thermodynamics"

Final competences
1. To know and be able to apply basic concepts of chemical kinetics.
2. To have insight in the factors that determine rate and mechanism of chemical reactions.
3. To know how to incorporate and evaluate experimental results concerning the rate of chemical reactions.
4. To have insight into the fundamental concepts of chemical thermodynamics of electrolyte solutions and equilibrium electrochemistry.
5. To know the theories which explain the experimental behavior of electrolyte solutions.
6. To have insight in the factors which determine the equilibrium potential at an electrode.
7. To have insight in the construction and principles of an electrochemical cell and its applications.

Conditions for credit contract

(Approved)
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: coached exercises.

Extra information on the teaching methods
Seminars: application of the learning material
Independent work: to translate a specific part of the course in a simulation.

Learning materials and price
Syllabus (Dutch)
Reference book (English)
Documents on Ufora

References

Course content-related study coaching
Possibility for personal explanation by the lecturer or assistant (on appointment)
Interactive support by ELO (forum)

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
Written examination with open questions, oral examination

Examination methods in case of permanent evaluation
Assignment

Possibilities of retake in case of permanent evaluation
Examination during the second examination period is possible.

Extra information on the examination methods
Theory: Oral with written preparation, testing of knowledge and insight in the subject matter (see contents)
Exercises: testing whether the concepts can be used for solving concrete problems
Independent work: translate a specific part of the course in a simulation

Calculation of the examination mark
Theory (60 %)
Exercises (30 %)
Independent work: (10 %)