

Physical Chemistry (E029010)

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

Credits 6.0 Study time 180 h Contact hrs 60.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	Dutch	lecture	30.0 h
		seminar: coached	30.0 h
		exercises	

Lecturers in academic year 2018-2019

Hens, Zeger WE06 lecturer-in-charge

Offered in the following programmes in 2018-2019

	crdts	offering
Bachelor of Science in Chemical Engineering and Materials Science	6	A
Bridging Programme Master of Science in Chemical Engineering	6	A
Bridging Programme Master of Science in Chemical Engineering	6	A
Preparatory Course Master of Science in Materials Engineering and Master of Science in Sustainable Materials Engineering	6	A

Teaching languages

Dutch

Keywords

Chemical Thermodynamics, Molecular Interactions, Chemical Potential, Reaction Kinetics

Position of the course

The course covers two elements of physical chemistry: chemical thermodynamics and chemical kinetics. The course aims at a thorough understanding of the concepts, laws and ways of thinking of chemical thermodynamics and of its applications to physical and chemical equilibrium. The relation between thermodynamical quantities and the molecular structure of matter is a key subject. The part on chemical kinetics will impart students the various aspects of the problem of reaction rate. Students should understand how rate equations are deduced from experimental data, how rate equations and reaction mechanisms are related and how the reaction rate is interpreted theoretically.

Contents

- Principles of chemical thermodynamics: Gases - Intermolecular forces, Energy - Thermochemistry, Entropy, Gibbs free energy - Change and equilibrium
- Physicochemical equilibrium: Equilibrium in one-component systems, Equilibrium in binary mixtures, Chemical equilibrium, Equilibrium at surfaces
- Electrochemical equilibrium: Ionic solutions, Electrodes and the electrochemical cell
- Chemical kinetics: Experimental kinetics, Bimolecular gas reactions, Gas reactions, Liquid phase reactions, Catalysis, Reactions at surfaces

Initial competences

Final competences

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: coached exercises

Learning materials and price

Course notes

References

Course content-related study coaching

Evaluation methods

end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period

Open book examination, oral examination

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

Open book examination, 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

During examination period: oral closed-book exam, written preparation; written open-book exam - problems

Calculation of the examination mark