CK204V Surfaces, Colloids and Soft Matter 5.0 credits

Ytor, kolloider och mjuka material

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for CK204V valid from Autumn 2022

Grading scale

P, F

Education cycle

Second cycle

Main field of study

Chemical Science and Engineering

Specific prerequisites

Equivalent knowledge to a bachelors degree, minor or major, in chemistry, chemical engineering, or material science. and proficien. English corresponding to English B/6.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After completing the course, a student should be able to:

- Explain aspects of surface, colloid and soft matter chemistry.
- Apply surface and colloid science on interfacial phenomena.
- Communicate and present surface and colloid science.

Course contents

- Principles of Surface and Colloid Science
- Thermodynamics of surface tension, adsorption and interacting surfaces, as well as the relevant experimental approaches.
- Capillarity
- Electrostatics of interfaces and titration of surface charge
- Electrokinetic phenomena
- Surface forces: double layer forces, van der Waals forces, steric forces, hydration forces and colloidal stability
- Stablising dispersions
- Adhesion
- Wetting, including superhydrophobicity.
- Applications of surface chemistry, with focus on paper industry, flotation and cleaning
- Adsorption: From gases and liquids, including polymers, polyelectrolytes and the formation of polyelectrolyte complexes. Solution behaviour of polyectrolytes.
- Surface modification
- Surfcatant properties and association to micelles, vesicles, liquid crystals and biomembranes.
- Emulsions, microemulsions and foams.
- Gels

Examination

- INL1 - Assignment, 2.0 credits, grading scale: P, F
- RAP1 - Report, 3.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.