Level: PhD

Course title: Chemistry of Complex Equilibria (DSH-710)

Status: Elective

ECTS: 15

Requirements: None

Learning objectives

The goal of the course is to provide advanced knowledge of the theoretical and practical aspects of complex equilibria and complex application in chemical analysis.

Learning outcomes

After successful completion of the course, a student is able to:

- Apply advanced knowledge of complex formation, complex stability, equilibria processes and numerical and computational methods in analytical chemistry.
- List and explain interactions in complex equilibria.
- Independently solve problems related to complex equilibria in analytical chemistry.
- Apply mathematical equations and computer programs in calculation of stability constants.
- Adequately operate instruments for measuring physical and chemical characteristic of complex systems.

Syllabus

Theoretical instructions

Coordination compounds and their properties. Complex formation equilibria. Complex formation kinetics. Energy parameters of the complex formation. Influence of the solvent on complex equilibria. Mathematical considerations and evaluation of experimental data. Experimental methods for stability and protonation constants determination (potentiometry, spectroscopy). Selectivity of complex reagent. Application of the complexes in analytical chemistry. Complexes in volumetric titrations. Ion-exchange chromatography. Luminescence and hemiluminiscence. Liquid-liquid extraction and separation of the metal ions.

Other forms of teaching

Review of the literature. Project preparation.

Weekly teaching load				Other:
Lectures: 5	Exercises:	Other forms of teaching:	Student research: 5	