KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego

UNIA EUROPEJSKA
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FUNDUSZ SPOŁECZNY

Course title	ECTS code
Monographic lecture - Research methods in supramolecular chemistry	13.3.0430

Name of unit administrating study

Faculty of Chemistry

Studies

faculty	field of study		
Wydział Chemii	Chemia	type	drugiego stopnia
		form	stacjonarne
		specialty	chemia biomedyczna, chemia i technologia środowiska, analityka i diagnostyka chemiczna, chemia obliczeniowa
		specialization	wszystkie

Teaching staff

prof. dr hab. inż. Tadeusz Ossowski; dr Dorota Zarzeczańska; dr Paweł Niedziałkowski

Forms of classes, the realization and number of hours

Forms of classes

Lecture

The realization of activities

classroom instruction

Number of hours

Lecture: 30 hours

ECTS credits

3
classes - 30 h
tutorial classes – 10 h
student's own work – 35 h

Total: 75 h - 3 ECTS

The academic cycle

2023/2024 winter semester

Type of course

obligatory

Language of instruction

polish

Teaching methods

- multimedia-based lecture
- problem-focused lecture

Form and method of assessment and basic criteria for eveluation or examination requirements

Final evaluation

Graded credit

Assessment methods

written exam (test)

The basic criteria for evaluation

A positive grade may be obtained when 51% of the total points are obtained from three interim tests conducted during the semester

Method of verifying required learning outcomes

Required courses and introductory requirements

A. Formal requirements

Completed course in analytical chemistry, organic chemistry, physical chemistry and instrumental analysis

B. Prerequisites

knowledge of the types of intermolecular interactions, knowledge of basic physicochemical methods, knowledge of basic types organic and inorganic compounds

Aims of education

The brief students with current issues in coordination chemistry and supramolecular chemistry,
- to evaluate individual physicochemical methods in terms of molecular recognition,
- to acquaint students with spectrophotometric and electrochemical methods used in the study of equilibria in solution,
- to acquaint students with calculation methods and modeling of equilibria in solution,
- to learn how to choose a research technique to characterize intermolecular interactions

Course contents

Supramolecular chemistry versus coordination chemistry. Methods for determining the stoichiometry of interactions and determining equilibrium constants. Review
experimental methods, applicability analysis, measurement techniques. Calorimetric methods, thermodynamic aspects of
aspects of supramolecular interactions. Extraction methods. Spectroscopic methods: NMR, IR, UV-Vis, MS (measurement and calculation techniques). Chromophoric systems in supramolecular chemistry. Graphical methods for equilibrium model determination versus computational methods (Henderson-Hasselbach, Rosse Drago and others). Electrochemical methods in equilibrium studies: conductometry, potentiometry, voltammetric methods. Methods of examination of modified surfaces. Nanotechnology and supramolecular methods.

Bibliography of literature

Literature required to pass the course
C. Schalley - Analytical Methods In Supramolecular Chemistry, WileyVCH, 2007
J. Polster, H. Lachman - Spectroscopic Titration, VCH 1986

The learning outcomes (for the field of study and specialization)

Knowledge

1. Defines coordination and supramolecular systems.
2. Recognizes the relationship between the type of interactions and the thermodynamic and
kinetic stability of supramolecular bonds.
3. Describes basic laws and principles of intermolecular interactions.
4. Describes the basic methods used in the characterization of physicochemical equilibria in coordination and supramolecular systems.

Skills

Social competence

1. Understands the need for independent search for information in the literature concerning the latest scientific reports.
2. Understands the connection of supramolecular interactions with the development of modern technologies and medicine.

Contact

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