


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
 Europejskiego Funduszu
 Społecznego

UNIA EUROPEJSKA
 EUROPEJSKI
 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	type	drugiego stopnia
Wydział Chemii	Chemia	form	stacjonarne
		specjalty	chemia biomedyczna, chemia i technologia środowiska, analityka i diagnostyka chemiczna, chemia obliczeniowa
		specialization	wszystkie
Teaching staff			
prof. dr hab. inż. Tadeusz Ossowski; dr Paweł Niedziałkowski; dr Dorota Zarzeczkańska			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		3	
Lecture		classes - 30 h	
The realization of activities		tutorial classes – 10 h	
classroom instruction		student's own work – 35 h	
Number of hours		Total: 75 h - 3 ECTS	
Lecture: 30 hours			
The academic cycle			
2023/2024 winter semester			
Type of course		Language of instruction	
obligatory		polish	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
- multimedia-based lecture		Final evaluation	
- problem-focused lecture		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

tadeusz.ossowski@ug.edu.pl