University of Gdańsk

Subject card

Subject name and code	Monografic lecture - Research methods in supramolecular chemistry, PG_00057826		
Field of study	Chemical Business		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2025/2026
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	academic	Assessment form	credit
Conducting unit	Department of Analytical Chemistry -> Faculty of Chemistry -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Dorota Zarzeczańska	
	Teachers	dr Dorota Zarzeczańska dr hab. Paweł Niedziałkowski	

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						

Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	30	20.0	25.0	75

Subject objectives	
	introducing students to: current issues of coordination and supramolecular chemistry, evaluation of individual physicochemical methods in terms of molecular recognition, introducing students with spectrophotometric and electrochemical methods used in the study of equilibria in solution, familiarize students with computational methods and modeling of equilibria in solution, developing the ability to select research techniques for characterizing intermolecular interactions

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BCHMU2_K04] Is willing to properly assess the acquired knowledge, respect and disseminate it in order to solve specific cognitive and practical issues.	1. Understands the need to independently search for information in the literature regarding the latest scientific reports. 2. Recognizes the connection between research on supramolecular interactions and the development of modern technologies and medicine	[SK1] oral statement/conversation/ discussion [SK4] test/exam - oral or written
[BCHMU2_W01] Knows and understands complex physicochemical processes and is able to analyse their course in connection with other fields of science.	Describes the basic methods used in the physicochemical characterization of equilibria in coordination and supramolecular systems.	[SW4] test/exam - oral or written
[BCHMU2_U02] Is able to define her/his interests, develop them within the chosen direction and in connection with the subject of her/ his master's thesis by implementing the process of self-education and planning her/his professional career.	Interprets measurement results obtained during spectrophotometric and electrochemical analysis used in the study of equilibria in solutions.	[SU4] test/exam - oral or written
[BCHMU2_U01] Is able to, on the basis of her/his knowledge, propose a solution to problems in chemistry, taking into account the economic aspect by using advanced measurement techniques.	1. Uses appropriate physicochemical techniques and methods characterize the properties of supramolecules. 2. Is able to explain the principles of measurement of basic physical quantities and	[SU4] test/exam - oral or written
[BCHMU2_W05] Knows and understands the main trends in the development of chemistry combined with economics as two interpenetrating scientific disciplines.	1. Defines coordination and supramolecular systems. 2. Recognizes the relationship between the type of interactions and the thermodynamic and kinetic stability of supramolecular connections. 3. Describes the basic laws and principles of intermolecular interactions.	[SW4] test/exam - oral or written

Subject contents

Supramolecular chemistry and coordination chemistry. Methods for determining the stoichiometry of interactions and determining equilibrium constants. Review of experimental methods, suitability analysis, measurement techniques. Calorimetric methods, thermodynamic aspects of supramolecular interactions. Extraction methods. Spectroscopic methods: NMR, IR, UV-Vis, MS (measurement and computational techniques). Chromophore systems in supramolecular chemistry. Graphical methods for determining the equilibrium model and computational methods (Henderson-Hasselbach's method, Rosse Drago and others). Electrochemical methods in the study of equilibria: conductometry, potentiometry, voltammetric methods. Methods of testing modified surfaces. Nanotechnology and supramolecular methods

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
final test	51.0%	100.0%

Recommended reading

Basic literature	M. Ciesielska J. Starosta, M. Wasielewski - Wstęp do chemii koordynacyjnej, PWN 2010 H. Dodziuk - Wstęp do chemii supramolekularnej, Wydawnictwo UW 2008 Ch. A. - Analytical Methods In Supramolecular Chemistry, Wiley VCh 2007
Supplementary literature	J. Polster, H. Lachman - Spectroscopic Titration, VCH 1986
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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