



KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez
Unię Europejską w ramach
Europejskiego Funduszu
Społecznego

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY



Course title		ECTS code	
Basic chemical equilibria in aqueous solution		13.3.1200	
Name of unit administrating study			
null			
Studies			
faculty	field of study	type	first tier studies (BA)
Faculty of Chemistry	Chemical Business	form	full-time
		specialty	all
		specialization	all
Faculty of Chemistry	Chemistry	type	first tier studies (BA)
		form	full-time
		specialty	all
Faculty of Chemistry	Environmental Protection	specialization	all
		type	first tier studies (BA)
		form	full-time
		specialty	all
		specialization	all
Teaching staff			
dr hab. Dariusz Wyrzykowski			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		2 classes - 15 h tutorial classes - 15 h student's own work - 20 h TOTAL: 50 h - 2 ECTS	
Lecture			
The realization of activities			
lectures in the classroom			
Number of hours			
Lecture: 15 hours			
The academic cycle			
2023/2024 summer semester			
Type of course		Language of instruction	
an elective course		english	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
multimedia-based lecture		Final evaluation	
		Graded credit	
		Assessment methods	
		- written exam with open questions - written exam (test)	
		The basic criteria for evaluation	
Method of verifying required learning outcomes			
A positive written exam consisting of open questions covering the issues presented during the lectures as well as simple tasks/exercises solved during the lectures during the lecture the student solves problems (oral answer) in the field of solution chemistry			
Required courses and introductory requirements			
A. Formal requirements			
lack			
B. Prerequisites			
lack			

Aims of education presenting basic issues in solution chemistry familiarize students with fundamental properties of the electrolytes in aqueous solutions familiarize students with the basis of chemical calculations in the field of solution chemistry	
Course contents Topics: acid-base equilibria Buffer solutions and polyprotic acids Complexation equilibria (complex equilibria, competing equilibria, stepwise complexation) Species distribution diagrams	
Bibliography of literature Extracurricular readings Robert de Levie, How to Use Excel® in Analytical Chemistry And in General Scientific Data Analysis, Cambridge University Press (2001) Jean-Louis Burgot, Ionic Equilibria in Analytical Chemistry, Springer Science+Business Media (2012) Brian M. Tissue, Basics of Analytical Chemistry and Chemical Equilibria, John Wiley & Sons, Inc. (2013)	
The learning outcomes (for the field of study and specialization) Chemical Business: K_BCh_W03: describes in an advanced level the techniques of higher mathematics and IT tools necessary to describe and model chemical phenomena and technological processes K_BCh_W07: describes the construction and operating principles of scientific, technological and control-measuring apparatus K_BCh_U08: uses the chemical nomenclature and engineering terminology properly Chemistry: K_W02: describes in an advanced level the properties of electrolytes in aqueous solutions K_W08: demonstrates knowledge of computational methods to solve problems in chemistry, physics, mathematics K_U01: identifies, analyses and solves problems in the field of broadly understood solution chemistry on the basis of the acquired knowledge K_U08: presents in an understandable way the facts about chemistry using a scientific language typical of chemical sciences K_U09: is able to learn independently K_K06: raises her/his professional and personal competences by using information provided in various sources Environmental Protection: K_OŚI_W01: describes in an advanced level physical, chemical and biological phenomena occurring in nature K_OŚI_U04: uses specialist language in the discussion and properly uses the nomenclature in the field of environmental protection and individual disciplines related to it K_OŚI_K05: identifies the level of her/his knowledge and skills, demonstrates the need to update knowledge about the environment and its protection, demonstrates the need for continuous professional training and personal development	Knowledge Students know the basic properties of electrolytes (acids, bases, complex compounds) in aqueous solutions
	Skills Students present plainly the impact of a different environmental conditions (temperature, pH, the presence of other species) on equilibria of electrolytes in aqueous solutions; explain similarities and differences in properties of different types of electrolytes, notice causal links in chemical processes performed in aqueous solutions, where typical chemical equilibrium reactions occur; explain course of different phenomena from everyday life with the use of chemical knowledge in correlation with other sciences; interpret information, formulates conclusions and explain opinions
	Social competence Students are aware of existing connections between the environment and chemistry; understand social aspects of practical use of knowledge and abilities as well as connected with them responsibility.
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