



KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez
Unię Europejską w ramach
Europejskiego Funduszu
Społecznego

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY



Course title		ECTS code	
Surfactants and biosurfactants		13.3.0422	
Name of unit administrating study			
Faculty of Chemistry			
Studies			
faculty	field of study	type	pierwszego stopnia
Wydział Chemii	Chemia	form	stacjonarne
		specjalty	chemia kosmetyków
		specialization	wszystkie
Teaching staff			
dr Iwona Dąbkowska; dr hab. Beata Grobelna, profesor uczelni; prof. dr hab. inż. Tadeusz Ossowski			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		3	
Laboratory classes, Lecture		classes - 45 h	
The realization of activities		tutorial classes – 5 h	
classroom instruction		student's own work – 25 h	
Number of hours		Total: 75 h - 3 ECTS	
Lecture: 15 hours, Laboratory classes: 30 hours			
The academic cycle			
2024/2025 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	
- conducting experiments - multimedia-based lecture		Final evaluation	
		Graded credit	
		Assessment methods	
		- written exam with open questions - written exam (test) - graded course credit based on individual grades obtained during the semester - written test - open test and questions	
		The basic criteria for evaluation	
		• obtaining 51% of points from the test consisting of 10-15 open questions (50%) and 10-15 test questions (50%) covering issues mentioned in the program of the lecture..	
Method of verifying required learning outcomes			
Required courses and introductory requirements			
A. Formal requirements			
completed a course in general chemistry, analytical chemistry and physical chemistry,			
B. Prerequisites			
the knowledge of the basics of general, inorganic and organic chemistry			
Aims of education			
<ul style="list-style-type: none"> familiarization with the structure and physical properties of surfactants and biosurfactants, familiarization with the application of industry surfactants and biosurfactants, familiarization with adsorption mechanisms and adsorption capacity of surfactants and biosurfactants. Presentation of the influence of the structure of surfactants on surface properties of adsorbents. 			

Course contents

A. Problems of the lecture:

Construction and physical properties of surfactants and biosurfactants, with particular reference to surfactants used in cosmetics. Classification of surfactants and biosurfactants. Acquainting with the basic utility properties of surfactants. Adsorption of surfactants at the solid-liquid interface. Methods for determining the adsorption volume at the solid-liquid interface. Micellisation of surfactants and biosurfactants. Methods for the production of surfactants. Detergents, wetting agents, dispersants, emulsifiers and foaming agents, solubilizers in cosmetic systems. Description of the applications of selected technologies with the participation of surfactants and their impact on the environment.

B. Laboratory exercises:

Methods of quantitative and qualitative determination of surfactants and biosurfactants, study of the process of ionic surfactants micellization, coagulation of colloids, viscosimetric mean molar mass of polymers, study of surfactant absorption on the interface, use of surfactants in cosmetics and cleaning agents

Bibliography of literature

Literature required to pass the course

1. Anastasiu A., „Środki powierzchniowo czynne”, WNT Warszawa, 1973.;
2. Tomaszewicz-Potępa A.: „Związki powierzchniowo czynne”. Wydawnictwo Politechniki Krakowskiej, Kraków 1999.
3. Ogonowski J., Tomaszewicz-Potępa A.: „Związki powierzchniowo czynne”. Wydawnictwo Politechniki Krakowskiej, Kraków 1999

Extracurricular readings

1. T.F. Tadros, “Surfactants in Agrochemicals”, Marcel Dekker, New York, 1994
2. W. Malinka, „Zarys chemii kosmetycznej”, Volumed, Wrocław, 1999.

A.3. Literatura uzupełniająca:

3. J. M. Rosen, “Surfactants and Interfacial Phenomena”, Wiley-Interscience, New York, 1989

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

Knowledge

1. describes the properties of surfactants and the technology of their production.
2. describes the stages of creating industrial processes and technical preparation of production with the participation of surfactants.
3. lists and describes selected uses of surfactants and their impact on humans and the environment.
4. Explains the concepts of free enthalpy, enthalpy and entropy of adsorption in surfactants.

Skills

1. Classifies and differentiates surfactants based on their chemical structure.
2. Interprets the phenomena occurring with the participation of surfactants.
3. Predicts the role of surfactants and biosurfactants in cosmetics, medicine, chemical and technological processes.

Social competence

1. Improves skills in the use of measurement methods and techniques.
2. Effectively communicates in a group and uses the experience of other people.
3. It is guided by the principle of saving materials and resources.
4. The student understands the need for further education, information retrieval in literature and critical interpretation of experiments.

Contact

iwona.dabkowska@ug.edu.pl