GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	SURFACTANT TECHNOLOGY, PG_00064323		
Field of study	Chemical Technology		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
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	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Biotechnology and Microbiology -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Patrycja Szumała	
	Teachers	dr hab. inż. Patrycja Szumała	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	0.0	45

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 758 TECHNOLOGIA ZWIAZKÓW POWIERZCHNIOWO CZYNNYCH 2025/2026
https://enauczanie.pg.edu.pl/2025/course/view.php?id=758

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	45	10.0	45.0	100

Subject objectives

Theoretical and practical classes on obtaining surface-active compounds, their properties and possibilities of use in various detergent products. Learning about other ingredients of cleaning agents for use in households and industry.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_K01] critically evaluates the content of cognitive and practical problems	Knows the problems associated with obtaining and using detergents; is able to produce ecological products	[SK5] Assessment of ability to solve problems that arise in practice
[K7_U05] uses instrumental methods applied in technology and related fields	The student has in-depth knowledge of the technology of obtaining and analyzing surface-active compounds; is familiar with their properties in solutions and detergent preparations; knows the components of selected detergents and their action as well as production methods	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information

Subject contents

1. Surfactants, their structure and types.
2. Physicochemical properties of surfactants and their solutions.
3. Technology for obtaining surface-active agents.
4. Anionic surfactants; soaps, primary and secondary alkyl sulfates, alkyl and alkylaryl sulfonates and other surfactants derived from fatty acids.
5. Cationic surfactants.
6. Amphoteric surfactants.
7. Non-ionic surface-active compounds; fatty acid esters with polyols, polyoxyethylene products (fatty alcohols, fatty acids, alkylphenols).
8. Theories of detergents and mechanism.
9. Components of selected detergent products and their action.
10. Methods of producing selected household chemical products.
11. Industrial detergents.

Prerequisites and co-requisites

Basic terms and definition on organic chemistry and selected analytical methods.

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Exam</td><td>60.0%</td><td>60.0%</td></tr>
<tr><td>Evaluation of laboratory tests and reports</td><td>100.0%</td><td>40.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Zieliński R., Surfaktanty towaroznawcze i ekologiczne aspekty ich stosowania, Wydawnictwo Akademii Ekonomicznej w Poznaniu, Poznań, 2000.

2. Ogonowski J., Tomaszkiewicz-Potępa A., Związki powierzchniowo czynne, podręcznik dla studentów wyższych szkół technicznych, Politechnika Krakowska, Kraków 1999.

3. Gunstone F., Padley F., Lipid Technologies and Applications, Marcel Dekker Inc., New York, 1997.

4. Ho Tan Tai L., Formulating Detergents and Personal Care Products, AOCS Press, Chapaign, Illinois, 2000.

5. Karsa D.R., Industrial Applications of surfactants III, The Royal Society of Chemistry, Wiltshire, 1992.

6. Tadros, T.F., Applied Surfactants, Wiley-VCH, Weinheim, 2005</td></tr>
<tr><td>Supplementary literature</td><td>1. Industry standards

2. Smulders E., Laundry Detergents, Wiley-VCH, Weinheim, 2002.

3. Hummel D.O., Handbook of Surfactant Analysis, John Willey and Sons Ltd, 2000.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">Detergency theories

Synthesis of Sulphated Fatty Alcohols</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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