GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Chemical laboratory, PG_00063339		
Field of study	Nanotechnology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Obligatory subject group 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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Inorganic Chemistry -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Katarzyna Kazimierczuk	
	Teachers	dr hab. Katarzyna Kazimierczuk dr inż. Jan Alfuth	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	30.0	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	5.0	15.0	50

Subject objectives

The aim of the laboratory classes is to show students, through carefully selected examples, how the properties of elements and the compounds they form manifest in nature and how they are used in science and technology, especially in nanotechnology. An additional goal is to consolidate the chemical knowledge acquired in the previous semester.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U02] can analyze and solve simple scientific and technical problems based on possessed knowledge, applying analytical, numerical, simulation and experimental methods.	The student is able to plan and conduct simple laboratory experiments based on the knowledge they possess, using the experimental methods they have learned.	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K6_U04] can plan and conduct experiments, critically analyze their results, draw conclusions and formulate opinions. Has laboratory experience.	The student is able to perform basic experiments in a chemistry laboratory. They prepare accurate reports on the experiments conducted.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K6_W05] has knowledge of inorganic and organic chemistry, physical chemistry and chemical thermodynamics.	The student knows the properties of elements and simple compounds, as well as the reactions involved in the formation of compounds, and understands the impact of structure on properties. They provide examples of the significance of compounds in chemistry, particularly in the chemistry of nanomaterials.	[SW1] Assessment of factual knowledge

Subject contents

Topics of the classes:

- Redox reactions
- Complex compounds
- Qualitative analysis of selected ions
- Separation of a multicomponent mixture containing acidic, basic, and neutral compounds
- Crystallization and simple distillation
- Vacuum distillation

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="2">The course "General and Inorganic Chemistry" has been successfully completed in semester 1.</td></tr>
<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>tests and detailed reports</td><td>50.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>• L. Jones, P. Atkins, L. Leroy, General Chemistry, PWN Scientific Publishing, 2020, 2nd edition;
• University Scripts: J. Prejzner, Inorganic Chemistry. Laboratory, PG Publishing, Gdańsk 2004.
• A. Kołodziejczyk, K. Dzierzbicka, Fundamentals of Organic Chemistry, Volume 1 and 2, PG Publishing, Gdańsk, 2020.
• K. Dzierzbicka, G. Cholewiński, J. Rahcoń Apparatus and Unit Processes Used in the Organic Chemistry Laboratory. Gdańsk University of Technology Gdańsk 2018.</td></tr>
<tr><td>Supplementary literature</td><td>• J. Minczewski, Z. Marczenko, Analytical Chemistry. Vol. 1: Theoretical Foundations and Qualitative Analysis, PWN, 2012.</td></tr>
<tr><td>eResources addresses</td><td>Podstawowe
https://www.youtube.com/watch?v=z-TWrfb6C-Q - Instructional video
https://www.youtube.com/watch?v=Q3AHURxC6UQ - Instructional video
https://www.youtube.com/watch?v=SL0Jjzo04JE - Instructional video
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44325 - Description of individual exercises – instructions posted on the e-learning platform.
Adresy na platformie eNauczanie:
2024/25 Pracownia chemiczna dla kierunku Nanotechnologia semestr II - Moodle ID: 44325
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44325</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">• Based on the electron balance, select the stoichiometric coefficients in the redox equation:
aPbS + b HNO ₃ cS + dPb(NO ₃) ₂ + eNO + fH ₂O
• Write a characteristic reaction for detecting the ammonium ion.
• Which acid-base theories are applicable to the description of complex compounds?
• Provide three examples of molecules and ions that act as ligands. What are chelating ligands? Provide examples of such ligands.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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