GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	INORGANIC CHEMISTRY, PG_00064385		
Field of study	Chemistry		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Inorganic Chemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Łukasz Ponikiewski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	30.0	0.0	0.0	60

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	60	10.0	55.0	125

Subject objectives

The aim of the course is to familiarize students with the inorganic chemistry of the s-, p-, d- and f-block elements, including their structure, chemical and physical properties, periodic trends, as well as the practical importance of metals and their compounds in technology and everyday life.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W03] demonstrates knowledge in the area of theoretical chemistry and related engineering disciplines, necessary to predict structures, design and conduct basic process operations using molecular mechanics tools	has the knowledge of inorganic chemistry necessary to characterize the chemical compounds used in the chemical industry	[SW1] Assessment of factual knowledge
[K6_U05] designs and performs experiments to confirm a hypothesis, recognises the wider, often non-technical context of the phenomena analysed	Using scientific literature, the student is able to develop a chemical synthesis, carry it out, and then identify the reaction product using spectroscopic methods.	[SU1] Assessment of task fulfilment
[K6_U09] is able to recognise hazards, counteract them and work with chemical reagents and basic technical apparatus in accordance with health and safety principles and the concept of sustainability	is able to work safely in a chemistry laboratory in accordance with health and safety regulations; is able to identify potential hazards in working with various chemical reagents and eliminate potential sources of danger.	[SU1] Assessment of task fulfilment
[K6_W02] classifies acquired information, assessing its usefulness in solving the posed problems concerning the synthesis and analysis of selected groups of compounds, determining their physical and chemical properties, making measurements and determining the parameters of chemical reactions and processes	knows the properties of the elements in the periodic table and can identify potential applications of individual elements and chemical compounds in both everyday life and industry.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture

- Solid-State Chemistry, Ionic Crystals
- Chemistry of s-block elements alkali metals
- Chemistry of s-block elements alkaline earth metals
- Chemistry of d-block elements elements ScZn versus YCd and LaHg, lanthanide contraction, scandium group
- Titanium group
- Vanadium group
- Chromium group
- Manganese group
- Iron triad
- Light and heavy platinum group metals
- Copper group
- Zinc group
- Lanthanides and actinides

Course content – laboratory

As part of the laboratory exercises, students continue exploring the physical and chemical properties of inorganic compounds and simple methods of their separation and identification, which they began in the second semester. In addition, students gain basic experimental skills in inorganic chemistry.

The laboratory course includes:

a) analysis of three inorganic substances: a metal, a nonmetal, an oxide, a hydroxide, an inorganic acid, and a salt (a cation and an anion from among those discussed in Semester II);

b) analysis of a mixture of salts—cations and anions from among those discussed in the second semester;

c) determination of the content of selected ions in food products and fertilizers;

d) inorganic preparation;

Prerequisites and co-requisites

None

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Lesture: written exam	60.0%	60.0%
Laboratory: tests and reports	46.67%	40.0%

Recommended reading

Basic literature	Mark Weller, Tina Overton, Jonathan Rourke, Fraser Armstrong: Inorganic chemistry Tom 2, Wydawnictwo Naukowe PWN
Supplementary literature	Adam Bielański, Basics of Inorganic Chemistry, PWN
eResources addresses	

Example issues/ example questions/ tasks being completed	The reaction occurring at the cathode of operating lithium-ion batteries is: A) reduction of cobalt(IV) B) oxidation of cobalt(III) C) reduction of Li(I) D) oxidation of lithium An insoluble sodium mineral in water is: A) natrolite B) sylvite C) halite D) sodium nitrite The orange-yellow light of some discharge lamps results from using vapor of: A) strontium B) sodium C) lithium D) rubidium The products of the reaction of manganese dioxide with sulfuric acid are: A) manganese(II) sulfate(VI), hydrogen, and water B) manganese(II) oxide, sulfur dioxide, and water C) manganese(II) sulfate(VI), sulfur dioxide, and water D) manganese(II) sulfate(VI), oxygen, and water E) manganese(II) sulfate(IV), oxygen, and water If 0.1065 g of a brass sample dissolved in nitric acid causes the precipitation of 0.1270 g of iodine from a KI solution, the copper content in the brass is: A) 60% B) 70% C) 75% D) 80% In the Mond process for nickel purification, the following volatile nickel compound is used: A) NiO B) NiCl C) Ni(CO) D) NiCO Platinum(II) chloride can be obtained in the following reaction: A) Pt + 2HCl PtCl + H B) Pt + Cl PtCl C) PtCl PtCl + Cl D) Pt + CCl PtCl + C + Cl
Practical activites within the subject	Not applicable

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