KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego

UNIA EUROPEJSKA
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FUNDUSZ SPOŁECZNY

Course title	ECTS code
Monographic lecture – Application of oxidation processes in chemistry	13.3.1170

Name of unit administrating study

Faculty of Chemistry

Studies

faculty	field of study		
Wydział Chemii	Chemia	type	drugiego stopnia
		form	stacjonarne
		specialty	chemia biomedyczna, analityka i diagnostyka chemiczna, chemia i technologia środowiska, chemia obliczeniowa
		specialization	wszystkie

Teaching staff

prof. dr hab. inż. Lech Chmurzyński; prof. dr hab. Ewa Siedlecka; dr hab. Joanna Makowska, profesor uczelni; dr hab. Dariusz Wyrzykowski; dr Aleksandra Tesmar

Forms of classes, the realization and number of hours

Forms of classes

Lecture

The realization of activities

classroom instruction

Number of hours

Lecture: 30 hours

ECTS credits

3
classes - 30 h
tutorial classes – 10 h
student's own work – 35 h

Total: 75 h - 3 ECTS

The academic cycle

2023/2024 winter semester

Type of course

obligatory

Language of instruction

polish

Teaching methods

- critical incident (case) analysis
- discussion
- group work
- multimedia-based lecture
- problem-focused lecture

Form and method of assessment and basic criteria for eveluation or examination requirements

Final evaluation

Graded credit

Assessment methods

- assignment work – project or presentation
- graded course credit based on individual grades obtained during the semester

The basic criteria for evaluation

positive assessment of the presentation and activity in discussions covering the subject

Method of verifying required learning outcomes

Required courses and introductory requirements

A. Formal requirements

general chemistry, inorganic chemistry, analytical chemistry, physical chemistry, organic chemistry

B. Prerequisites

Aims of education

presentation of the development of physicochemical research in solid and liquid phases over the last century,
• familiarization with the basic instrumental methods used in the characterization of test substances in scientific works,
• presentation of the diversity of scientific works carried out under the supervision of KChOiN employees,
• developing the ability to independently plan experimental work and solve problems
• preparation for independent selection of scientific literature, leading consequently to the preparation of a master's thesis

Course contents

Radicals and their types, radical reactions, the role of radical reactions in nature, classification of advanced oxidation processes (AOP), methods generation of radicals and other chemical species of the nature of oxidants and reducing agents, the use of AOP in water treatment, the use of AOP in wastewater treatment, the use of reduction processes in the production of fuels, the use of radicals in medicine, the use of radicals in chemical synthesis, a review of the experimental methods used to study the antioxidant activity of natural compounds and synthetic compounds, including complex compounds, methods based on the HAT mechanism (hydrogen atom transfer), methods based on the mechanism SET (single electron transfer), electrochemical methods, factors determining the antioxidant activity of compounds

Bibliography of literature

Literature required to pass the course
Extracurricular readings
Literature provided by the teacher during the class

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

Knowledge

Can classify radicals and radicals reactions; divides AOP methods depending on a method for generating hydroxyl radicals; lists the applications of radicals, redox chemical species and their reaction in environmental protection, medicine, chemical synthesis; can list methods commonly used in the analysis and diagnosis of radicals reactions; understands the description and the course of AOP processes; characterizes and understands the process of transfer electrons; explains the relationship between the structure of the relationship and its redox activity

Skills

understands the interpretation of the results presented in scientific works; shows connections between the topics presented during the lecture and life; can indicate the application nature of the discussed and analyzed issues cases study; discusses the potential economic usefulness of the application of innovative methods that use radicals and chemical species of redox nature

Social competence

Discusses in a group collaborates with the colleagues, assumes various social roles (leader or performer etc.)

Contact

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