



Subject card

Subject name and code	Photodegradation and thermodegradation, PG_00035471						
Field of study	Corrosion						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-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	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 Physical Chemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Joanna Krakowiak					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	15.0	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	3.0	17.0	50		
Subject objectives	The students have to learn fundamental theoretical and practical concepts of the effect of temperature and UV-VIS radiation on useful properties of polymer materials and above all of the impact on their degradation process. The mechanisms and circumstances of the degradation processes as well as the factors which influence on this phenomenon are discussed. The students have to learn: (i) the susceptibility of the basic polymers to degradation influenced by temperature or UV-VIS radiation and (ii) about protection of polymers against those types of degradation.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_W05	The student has elementary knowledge about conditions of using of polymer materials and their protection against thermal and photodegradation			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	K7_U04	The student has elementary knowledge to estimate the risk of thermal and photodegradation in polymer materials.			[SU2] Assessment of ability to analyse information		
	K7_W01	The student has elementary knowledge of the mechanisms and kinetics of degradation processes affected by temperature or UV absorption.			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		
Subject contents	The impact of temperature and UV radiation on polymers properties and degradation is discussed. The mechanisms and circumstances of the degradation processes as well as the factors which influence on this phenomenon are discussed. The student has to learn which elements of the environment influence the kinetics of photo and thermal degradation to predict the life-time of polymer materials. The susceptibility of the basic polymers to degradation influenced by temperature or UV-VIS radiation as well as the way of protection against those types of degradation are presented.						
Prerequisites and co-requisites	Basic knowledge of polymer chemistry and physico-chemical processes						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	attendance	80.0%			10.0%		
	presentation	70.0%			40.0%		
	test in lectures	50.0%			50.0%		

Recommended reading	Basic literature	1. J. F. Rabek, Polymer photodegradation. Mechanisms and experimental methods, Chapman & Hall, 1995, London 2. Handbook of Polymer Degradation, pod red. S. Halim Hamid, Merceł Dekker, Inc., 2000 New York
	Supplementary literature	1. Allen, N.S., Edge, M. Fundamentals of Polymer Degradation and Stabilization, Springer Netherlands, 1993
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>1. Which processes occurring in polymers are slowed down by application of so-called stabilizers?</p> <p>2. Can a chemical substance acting as a stabilizer play also other roles in the polymer material? If so, provide an example.</p> <p>3. What is the impact of the structure of polymer molecules (linear, branched or networked) on its thermal stability?</p> <p>4. What do we mean by photodegradation? Describe clearly the factors causing this phenomenon.</p>	
Work placement	Not applicable	