GDAŃSK UNIVERSITY OF TECHNOLOGY

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 aboute 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 photodegration 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, Mercel Dekker, Inc., 2000 New York	
	Supplementary literature	1. Allen, N.S., Edge, M. Fundamentals of Polymer Degradation and Stabilization, Springer Netherlands, 1993	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. Which processes occurring in polymers are slowed down by application of so-called stabilizers? 2. Can a chemical substance acting as a stabilizer play also other roles in the polymer material? If so, provide an example. 3. What is the impact of the structure of polymer molecules (linear, branched or networked) on its thermal stability? 4. What do we mean by photodegradation? Describe clearly the factors causing this phenomenon.		
Work placement	Not applicable		