Study programme(s): Doctoral Academic Studies in Chemistry

Level: PhD studies

Course title: Advanced Course of Thermal Analysis	**Subject code:**	DSH-716

Lecturer(s): dr. Berta I. Barta Holló, associate professor

Status: elective

Semester (winter/summer): Winter

ECTS: 15

Requirements: None

Learning objectives

Methods of thermal analysis and their application in quality control of the selected materials, their role in industrial processes, etc.

Learning outcomes

Acquiring knowledge for analysis of experimental data and for their adequate interpretation. Solving problems related to changes in materials because of their thermal treatment.

Syllabus

Theoretical instruction

The effect of temperature change on the properties of materials. Different techniques of thermal analysis (TA): thermogravimetry (TG) and derivative thermogravimetry (DTG), differential thermal analysis (DTA) and differential scanning calorimetry (DSC), thermomechanical and dynamic thermomechanical analysis (TMA and DMA). Thermometric methods of analysis. Using thermoanalytical data to obtain kinetic parameters. Simultaneous methods of thermal analysis. Analysis of evolved gases (EGD and EGA).

Practical instruction

Thermal characterization of the selected materials using thermal analysis equipment.

Seminar paper

Evaluation and interpretation of the selected experimental data.

Literature

1. Principles and Applications of Thermal Analysis, P. Gabbott (ed.) Blackwell Publishing Ltd., 2008.
2. Hot Topics in Thermal Analysis and Calorimetry, Introduction to thermal analysis, Techniques and Applications, M. E. Brown (ed.), Kluwer Academic Publishers, New York, Boston, Dordrecht, London, Moscow, 2004.
3. Thermal Analysis of Polymers, Fundamentals and Applications, J. D. Menczel and R. B. Prime (ed.) John Wiley & Sons, Inc., Hoboken, New Jersey, 2012.

Additional literature:

1. Journal of Thermal Analysis and Calorimetry.
2. Thermochimica Acta
3. Journal of Analytical and Applied Pyrolysis

Weekly teaching load	Lectures:	Exercises :
150 (75+75)	5 (75)	5 (75)

Teaching methodology

Lectures, problem sessions, independent presentations carried out by students

Grading method (maximal number of points 100)

Pre-exam obligations	**points**	**Final exam**	**points**
Colloquia		Written exam	30
Seminars	50	Oral exam	20