Name:	***Trace analysis; activation analysis and radiochemical methods; chromatographic methods in trace anal (C-PS.II2-TraceAn)***
Name in Polish:	
Name in English:	***Trace analysis; activation analysis and radiochemical methods; chromatographic methods in trace anal***

Information on course:

Course offered by department:	Faculty of Chemistry
Course for department:	Faculty of Chemistry

Default type of course examination report:

Grading

Language:

English

Course homepage:

http://www.umcs.pl/pl/zaklad-metod-chromatograficznych,8639.htm

Description:

1. Chromatographic methods in trace analysis. Sensitivity optimization (injection of large volume sample, effect of column efficiency, effect of column diameter, effect of particle size). Importance of detection in chromatographic trace analysis. Detectors for GC and HPLC; The most important concepts in trace analysis – LOD, LOQ, baseline noise, signal to noise ratio, operation and dynamic linearity, detector sensitivity, detectoric constant, etc;

2. Discovery of radioactivity and a role of M. Sklodowska-Curie; radioactive decay; kinds of nuclear radiation emissions; absorption of radiation; radiation detectors (gazeous, scintillating and semiconducting detectors); spectrometric methods for determination of alpha and gamma emitting radionuclides.

3. Schema of trace analysis. Parameters that influence on results of trace analysis. Methods of trace analysis: stripping voltammetry, amperometry.

Bibliography:

1. C.F. Poole – The essence of chromatography, Elsevier Science; 1 edition 2002
2. J. R. Dean – Methods for environmental trace analysis, John Willey and Sons, Chichester 2003
3. S. Ahuja – Trace and ultratrace analysis by HPLC, John Wiley and Sons, New York 1992
4. M.F.l'Annunziata – Handbook of Radioactivity Analysis, Academic Press, Amsterdam 2003 (Department library or http://www.sciencedirect.com/science/book/9780123848734 (access from UMCS network)
5. J.Wang – Stripping Analysis, VCH Publishers, Florida 1985
6. J.Minczewski, J. Chwastowska, and R. Dybczynski – Separation and preconcentration methods in inorganic trace analysis, Ellis Horwood, Chichester 1982

All position of literature are available in Main Library of UMCS

Learning outcomes:

Knowledge
W1.Know the fundamentals and possibilities of the most important analytical techniques and have broader knowledge on how to select an appropriate analytical method to analyze a specific sample - K_W03
W2. Have in-depth knowledge of chromatographic methods - K_W04
W3. Have knowledge on the effects of nuclear and ionizing radiation on living organisms and concerning safe use of the phenomenon of radioactivity -K_W06

Skills
U1. Be able to interpret the results of research conducted using selected research methods frequently applied in trace analysis - K_U01
U2. Be able to select an appropriate analytical technique - K_U02
U3. Be able to use his/her knowledge to solve problems with a medium level of complexity, both theoretically and practically concerning trace analysis - K_U16

Attitudes
K1.Know the limitations of his/her knowledge and understand the need of further education and also be able to inspire the learning process in others, in particular in the area of natural sciences - K_K01

missing attribute description in English

Contact hours (work with an academic teacher)
Lecture - 15h
Total number of hours with an academic teacher - 15h
Number of ETCS points with an academic teachers- 0.5

Non-contact hours (students' own work)
Preparation for lectures - 2h
Literature studies - 7h
Preparation and partcipation in exam - 6h
Total number of non-contact hours - 15h
Number of ETCS points for non-contact hours- 0.5
Total number of ETCS points for the module 1
Consultation- 2h

missing attribute description in English

W1,W2, W3 - written colloquium
U1, U2, U3 - written colloquium
K1 - written colloquium

Requirements

Basic knowledge concerning chromatography, analytical chemistry and radiochemistry

Course credits in various terms:

<without a specific program>			
Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	1	14/15L	