

Teacher: **Mirela Samardžić, Ph. D., assistant prof.**
Course title: **Chemical analysis of surfactants**

Study programme:

Introduction, definition and classification of surfactants. Properties and application of surfactants. Analysis of anionic surfactants: titration, spectrophotometric, chromatographic and FIA/SIA methods. Analysis of cationic surfactants: titration, spectrophotometric, chromatographic and other methods. Analysis of nonionic surfactants: titration, spectrophotometric and other methods. Potentiometric surfactant sensors and their design. Determination of anionic surfactants by use of potentiometric sensors: response mechanism of potentiometric sensors, titrant selection by potentiometric surfactant titration, application of potentiometric surfactant sensors for analysis of environmental samples, titration of industrial wastewaters, influence of non-ionic surfactants, comparison of potentiometric methods with other analytical methods for anionic surfactant determination. Determination of non-ionic surfactants by use of potentiometric sensors: response mechanism of potentiometric sensor, titration of industrial wastewaters. Application of potentiometric surfactant sensors in Flow Injection Analysis (FIA). Estimation and optimization of response parameters of surfactant sensor from generated potentiometric titration data. Advantages and limitations of surfactant sensors. Future trends in development of potentiometric surfactant sensors.

Literature:

1. D. C. Cullum, **Introduction to Surfactant Analysis**, Springer Science+Business Media, 1994.
2. T. M. Schmitt, **Analysis of Surfactants**, 2nd Ed., CRC Press, 2001.
3. D. O. Hummel, **Handbook of Surfactant Analysis: Chemical, Physico-chemical and Physical Methods**, John Wiley and Sons, 2000.
4. T. Knepper, P. de Voogt, D. Barcelo, **Analysis and Fate of Surfactants in the Aquatic Environment**, Elsevier Science, 2003.

Biography:

Mirela Samardžić was born on 21 April 1983. Since 2007 she works in the Department of Chemistry, Josip Juraj Strossmayer University of Osijek and since 2013 she works as an assistant professor in the Subdepartment for Analytical, Organic and Applied Chemistry of the same Department. Research activities of Mirela Samardžić are based on the development, construction and application of chemical sensors, especially surfactant selective electrodes. She is also working on the devices for electrochemical measurements, and on the development of microfluidic techniques (Microchip Electrophoresis, Flow Injection Analysis, Sequential Injection Analysis) and their application in monitoring of biological compounds in biological materials and surfactants in environmental materials. Mirela Samardžić collaborated in 10 national and international scientific and technological projects. She published 13 original scientific papers cited in Current Contents (CC) database and she participated in 10 international and 5 national scientific conferences. She was awarded Golden medal on 39th Croatian Salon of Innovations INOVA 2014. She is a member of the Croatian Chemical Society (HKD).

Publications:

1. O. Galović, **M. Samardžić**, S. Petrušić, M. Sak-Bosnar:
Application of a New Potentiometric Sensor for Determination of Anionic Surfactants in Wastewater
Chem. Biochem. Eng. Q. 29 (2015) 307-313.
2. O. Galović, **M. Samardžić**, M. Sak-Bosnar:
A New Microsensor for the Determination of Anionic Surfactants in Commercial Products,
Int. J. Electrochem. Sci. 10 (2015) 5176-5193.
3. **M. Samardžić**, O. Galović, S. Petrušić, M. Sak-Bosnar:
The Analysis of Anionic Surfactants in Effluents Using a DDA-TPB Potentiometric Sensor,
Int. J. Electrochem. Sci. 9 (2014) 6166-6181.
4. O. Galović, **M. Samardžić**, S. Petrušić, M. Sak-Bosnar:
A new sensing material for the potentiometric determination of anionic surfactants in commercial products,
Int. J. Electrochem. Sci. 9 (2014) 3802-3818.
5. O. Galović, **M. Samardžić**, D. Derežić, D. Madunić-Čačić, M. Sak-Bosnar:
Potentiometric titration of micromolar levels of anionic surfactants in model effluents using a sensitive potentiometric sensor,
Int. J. Electrochem. Sci. 7 (2012) 1522-1531.

6. D. Madunić-Čačić, M. Sak-Bosnar, R. Matešić-Puač, **M. Samardžić**:
Potentiometric determination of anionic surfactants in formulations containing cocoamidopropyl betaine,
Int. J. Electrochem. Sci. 7 (2012) 875-885.
7. M. Sak-Bosnar, D. Madunić-Čačić, N. Sakač, **M. Samardžić**, Ž. Kurtanjek:
Estimation and optimization of potentiometric sensor response parameters from surfactant titration data using Microsoft Excel Solver and Mathematica,
Sensor Lett., 9 (2011) 491-498.
8. **M. Samardžić**, M. Sak-Bosnar, D. Madunić-Čačić:
Simultaneous potentiometric determination of cationic and ethoxylated nonionic surfactants in liquid cleaners and disinfectants,
Talanta, 83 (2011) 789-794.