Optimization of solid-phase extraction for analysis of artificial sweeteners in water

Eleonora Gvozdić[1], Ivana Matić Bujagić[2], Ljiljana Tolić Stojadinović[1], Svetlana Grujić[2]

[1] *Innovation Centre of the Faculty of Technology and Metallurgy, Karnegijeva 4, 11000 Belgrade*
[2] *Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, 11000 Belgrade*

Abstract. After decades of using artificial sweeteners in the food and pharmaceutical industry, their ubiquitous presence in the environment has been determined [1,2]. These substances are recognized as emerging pollutants due to limited data on their occurrence, environmental fate and ecotoxicity. Prior to analysis of artificial sweeteners at trace levels in water samples, it is necessary to isolate and concentrate analytes and clean-up the obtained extracts. In this paper, the optimization of the preparation method for the determination of saccharin, sucralose and neotame in water by solid-phase extraction (SPE) was performed. The extracts were analyzed by liquid chromatography–tandem mass spectrometry (LC–MS/MS). In the SPE optimization, the following parameters were tested: the sorbent type, the pH value and the volume of water sample and the elution solvent. The suitability of anion-exchange, polymeric, C18 and carbon sorbents for the extraction of selected sweeteners was assessed. The results showed that the highest recoveries were obtained using polymeric Oasis HLB cartridges, with copolymer poly(divinylbenzene-co-N-vinylpyrrolidone). Furthermore, it was determined that the pH value of water sample was crucial for extraction efficiency. For all three artificial sweeteners, the optimal pH value of the sample was 3. Finally, the sample volume of 100 ml ensured a high preconcentration factor without the sorbent breakthrough, and methanol was selected as the elution solvent.

References

1. P. Arbeláez, F. Borrull, E. Pocurull, R.M. Marcé, *J. Chromatogr. A.* **2015**, *1393*, 106.
2. J. Spolestra, N.D. Senger, S.L. Shiff, *J. Environ. Qual.* **2017**, *46*(6), 1434.

Acknowledgments

This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (project no. 172007).