ELECTROCHEMICAL DETECTION OF LEAD AT ZINC OXIDE NANOSTRUCTURE BASED MODIFIED ELECTRODE

Alexandra Belcovici[1], Carmen Ioana Fort*[1], Laura Elena Mureşan[2], Ioana Perhaiţa[2], Gheorge Borodi[3], Graziella Liana Turdean[1]

[1] Department of Chemical Engineering, Faculty of Chemistry and Chemical Engineering, Babeş-Bolyai University, 11 Arany János Street, RO-400028 Cluj-Napoca, Romania,
[2] "Raluca Ripan" Institute for Research in Chemistry, "Babes-Bolyai" University, 30 Fântânele Street, RO- 400294 Cluj-Napoca, Romania,
[3] National Institute for Research and Development of Isotopic and Molecular Technologies, 65-103 Donath, RO-400293 Cluj-Napoca, Romania
**e-mail: ioana.fort@ubbcluj.ro*

Abstract. A modified glassy carbon electrode (ZnO-Nafion/GCE) prepared by drop-casting technique, was investigated by square wave anodic stripping voltammetry (SWASV) for the detection of Pb^{2+} in synthetic and reals water samples.

Introduction. Heavy metals (HM) pollution represents one of the important dangers to the environment, and due to their toxicity, the HM detection is of great interest. Usually, the HM detection is performed by complex analytical methods such as atomic fluorescence spectroscopy, atomic absorbance spectroscopy, and inductive coupled plasma-mass spectroscopy, but, also by electrochemical methods based on the modified electrodes [1].

Experimental. The ZnO-Nafion/GC modified electrode was prepared by drop-casting method and was investigated by SWASV, using a PGStat 302N electrochemical workstation.

Results and discussion. The operational parameters (*i.e.*, HM deposition time, frequency, and pH of the buffer solution) for investigating the ZnO-NP-Nafion/GC modified electrode were optimized. The calibration curve for Pb^{2+} ions leads to obtaining the analytical parameters (*i.e.*, sensibility, linear domain, and limit of detection) which were in concordance with the literature data for other chemically modified electrodes. Moreover, the standard addition method was performed for Pb^{2+} detection in real water samples [2].

Conclusion. ZnO was used for preparing a sensitive ZnO-Nafion/GC modified electrode by a simple drop-casting method, and its investigation by SWASV led to obtaining good analytical parameters values in synthetic samples and the possibility to applying the device for detecting HM in real drilling water samples.

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References
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