34th International Conference on Solution Chemistry, 30 August-September 4, 2015, Prague, Czech Republic www.icsc.cz

Chemically modified electrodes based on polyazulene for metal ions detection

M. Ungureanu*, G. Buica*, I. Chilibon**, M. Mihai*, R. Isopescu*, C. Vasiliu**, I. Feraru**, R. Iordanescu**

* University POLITEHNICA of Bucharest, Faculty of Applied Chemistry and Materials Science 1-7 Gheorghe Polizu, 011061, Bucharest, Romania
** National Institute of Research and Development for Optoelectronics, INOE-2000, 409 Atomistilor Street, P.O. Box MG-5, Bucharest-Magurele, 077125, Romania, tel/fax: 4021.4574522, qilib@yahoo.com

ABSTRACT

Numerous health problems are associated with exposure to high levels of metal ions (e.g., Cd^{2+}, Pb^{2+}, Hg^{2+}) because of their tendency to be accumulated in the body, toxicity and low rate of clearance. Determination of trace levels form these elements in the environment is thus a highly important, yet challenging analytical problem. In the last years the electrochemical methods for detection of trace metals become very important since these methods offer several advantages, including remarkable sensitivity, inherent miniaturization and portability [1]. Electrochemical analysis using chemically modified electrodes represents a promising method for metals determination at trace levels [2]. Also, conducting polymers have attracted great attention due to their wide fundamental interest and potential industrial applications. Being formed by fusing a seven-membered ring with a five-membered ring, the azulene has low ionization energy and high electron affinity, being a very interesting building block among the monomers used for the synthesis of advanced materials. Here we present new complexing polymer-coated electrodes which have been synthesized by oxidative electropolymerization of azulene substituted with thiourea-like complexing groups monomers in acetonitrile solutions. The novel electrodes were used for the electrochemical complexation of Pb(II) and Cd(II) metal ions by means of the chemical preconcentration-anodic stripping technique.

Keywords: polyazulene, electropolymerization, electrochemical analysis, chemical preconcentration-anodic stripping technique

Acknowledgements.

The authors are grateful for the financial support from UEFISCDI project ID PN-II-PT-PCCA-2013-4-2151, contract nr. 236/2014.

References

[1] R. De Marco, G. Clarke, B. Pejcic, Electroanalysis 2007, 19–20, 1987.

[2] G.-O. Buica, C. Bucher, J.-C Moutet, G. Royal, E. Saint-Aman, E.-M Ungureanu Electroanalysis 2009, 21, 77.