Novel Electrode Materials for Monitoring of Biologically Active Organic Compounds

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ABSTRACT

Novel electrode materials recently developed and applied at our UNESCO Laboratory of Environmental Electrochemistry are briefly discussed.

Keywords: Amperometry; Voltammetry; Flowing systems; Solid amalgam; Boron doped diamond

INTRODUCTION

In spite of tremendous development in spectrometric and separation methods, modern electroanalytical methods can play an important role in monitoring of biologically active organic compounds because of low running and investment cost, easy miniaturization resulting in portability (on site analysis and point of care devices), high sensitivity and reasonable selectivity. However, to respond to ever increasing demands, it is necessary to develop and apply novel electrode materials which are crucial for successful voltammetric and or amperometric determination. And this is the most important part of our research in UNESCO Laboratory of Environmental Electrochemistry.

OBJECTIVES

We are searching for novel electrode materials with broader potential window, lower noise, compatible with different organic solvents (for possible application in HPLC with organic mobile phases), resistant to passivation (which is one of the biggest problems in practical applications of electroanalytical methods), mechanically stable (and thus compatible with measurements in flowing systems) and last but not least compatible with principles of green analytical chemistry.

METHODOLOGY

Attention will be paid to novel electrode materials and recently developed and applied in our laboratory, namely to novel amalgam electrodes [1], boron doped film electrodes [2], graphene oxide-based electrodes [3], non-traditional carbon film electrodes [4], glassy carbon electrochemical detectors [5] and non-enzymatic electrochemical approaches to cholesterol determination [6]. Attention will be also paid to possibilities of elimination of negative influence of electrode passivation [7].

CONCLUSION/RESULTS

Further search for novel electrode materials is an imperative in the sera for better, faster, cheaper and more user-friendly electroanalytical methods.

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