Abstract

The submitted work deals with the application of voltammetric determination of Fomesafen using non-traditional mercury meniscus modified silver solid amalgam electrode on model samples of Fomesafen in real aqueous matrices of drinking and river water. This method of measurement has been developed and optimized in my bachelor thesis, which the diploma thesis is related to.

Fomesafen belongs to a group of herbicides used on a mass scale in the late 20^{th} century in the USA and in many countries around the world still used even today. Among its side effects according to the EPA include, among others, potential carcinogenicity to humans and confirmed carcinogenicity to some mammals (such as rats) which led to a legislative regulation on its use in many countries around the world including the USA, the European Union and many others.

Silver solid amalgam electrode has been developed with the intention to limit the use of mercury in accordance with new legislation of the European Union and the concept of green analytical chemistry. Despite the low levels of mercury mainly bound in the form of virtually harmless silver amalgam electrode retains very similar electrochemical properties with proven mercury electrodes.

As part of the thesis, direct determination of a number of partial extraction of Fomesafen real matrices and drinking river water and unsuccessfully attempted preconcentration of substances by adsorption stripping voltammetry was carried out. The limit of determination achieved via direct determination was $1 \cdot 10^{-6}$ mol $\cdot$ dm^{-3} in the case of both drinking and river water. Within extractions, the lowest limit of determination achieved via extraction of drinking water was $1 \cdot 10^{-7}$ mol $\cdot$ dm^{-3} aplying the extraction with the level of preconcentration of 100 and the lowest limit of determination achieved via extraction of river water was $1 \cdot 10^{-7}$ mol $\cdot$ dm^{-3} as well, the level of preconcentration applied in this case was 10 though.

Keywords: Fomesafen, differential pulse voltammetry, adsorptive stripping voltammetry, solid silver amalgam electrode, solid phase extraction

Subject headings: herbicides, voltammetry, amalgam electrodes, extraction