

## ABSTRACT BOOK

# 4<sup>th</sup> EuCheMS Chemistry Congress

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**Analytical chemistry Electrochemistry, Analysis, Sample manipulation****Electroanalytical methods - III**

O-009

**POSSIBILITIES AND LIMITATIONS OF AMALGAM ELECTRODES****J. BAREK<sup>1</sup>, J. FISCHER<sup>1</sup>, K. PECKOVA<sup>1</sup>, V. VYSKOCIL<sup>1</sup>**<sup>1</sup> Charles University in Prague Faculty of Science, Department of Analytical Chemistry, Prague 2, Czech Republic

For the determination of electrochemically reducible organic substances, mercury is undoubtedly the best available electrode material.<sup>[1]</sup> However, mercury has some disadvantages (toxicity, low mechanical robustness, etc.) so that there is a constant search for other suitable electrode materials. Probably the most promising alternative are non-toxic and mechanically robust silver solid amalgam electrodes suitable both for voltammetry and for amperometry in flowing liquids.<sup>[2]</sup> The newly developed single crystal silver amalgam electrode<sup>[3]</sup> and other types of solid or paste amalgam electrodes can be very useful in this field as well. Practical applications of voltammetric and amperometric determination of micromolar and submicromolar concentrations various types of organic substances (environmental pollutants, chemical carcinogens, drugs and their metabolites, explosives, etc.) will be demonstrated together with construction of these novel electrodes and detectors based on various forms of silver amalgams.

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**Keywords:** *Electrochemistry; Amalgams; Voltammetry;*

**Electroanalytical methods - III**

O-010

**VOLTAMMETRY OF ANTIOXIDANTS IN SURFACTANT MEDIA AND ITS ANALYTICAL APPLICATION****G. ZIYATDINOVA<sup>1</sup>, E. ZIGANSHINA<sup>1</sup>, H. BUDNIKOV<sup>1</sup>**<sup>1</sup> Kazan (Volga Region) Federal University, Department of Analytical Chemistry, Kazan, Russia

Surfactants are widely put into practice of analytical chemistry at present time. Two important properties of them namely adsorption at the interface and aggregation into the organized structures are advantageously used in electrochemistry. Therefore, surfactants are able to modify and control the properties of electrode surfaces leading to changes in reaction rates and pathways. From other side, surfactants provide solubilization of organic compounds in water media and can be used in electrochemical studies.

Lipophilic antioxidants being widely distributed in foodstuff form important group of compounds playing key role in antioxidant defense system of living systems. Development of new methods for their determination is of interest. Lipophilic antioxidants are usually determined in organic media due to hydrophobic nature and the limited solubility of analyte in other solvents. Surfactant media can be used as less hazardous and versatile substitute for organic solvents in electrochemical determinations.

Voltammetric characteristics of retinol,  $\beta$ -carotene and eugenol have been studied in organic and water-organic media. All compounds under investigation are irreversibly oxidized on glassy carbon electrode. Effect of different types of surfactants and their concentration on voltammetric behavior of lipophilic antioxidants has been evaluated. The application of surfactant media leads to enlargement of linear working range for antioxidants determination. The decrease of low detection limits have been observed for all compounds under investigation.

Simple, express and reliable voltammetric methods for the retinol,  $\beta$ -carotene and eugenol determination in vegetable oils, spices, fruits and vegetables have been developed using preliminary extraction of analytes.

The application of surfactant media in voltammetry of lipophilic antioxidants allows to analyze them in water media or to decrease the organic solvent portion. The methods proposed is characterized by good reproducibility, speed and could be recommended for food quality control.

**Keywords:** *voltammetry; surfactants; antioxidants;*