Fyzikální ústav
Akademie věd ČR, v. v. i.

FACULTY OF SCIENCE
Charles University

MNB Group, Department of Functional Materials, Institute of Physics, CAS

Department of Analytical Chemistry, Faculty of Science, Charles University

in cooperation with the ***Working Group of Analytical Chemistry*** and the ***Working group of Electrochemistry*** of the ***Czech Chemical Society***

cordially invite you to attend the lecture:

Diamond and Diamond-Like Carbon: Next-Generation Electrodes for Electroanalysis

Prof. Greg M. Swain

Michigan State University, Department of Chemistry, USA

DATE: **Wednesday 26th September 2018**

TIME: **10.00 am**

VENUE: **Velký Sál, Fyzikální ústav AV ČR, v. v. i., Na Slovance 1999/2, 182 21 Praha 8**

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Diamond and Diamond-Like Carbon: Next-Generation Electrodes for Electroanalysis

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Michigan State University, Department of Chemistry, USA

Carbon electrodes are routinely used in electrochemical detectors and sensors to quantify *electroactive* analytes in solution. By electroactive, one is referring to molecules that are easily oxidized or reduced at an electrode surface. Generally speaking, electrochemical measurements often involve application of a potential to an electrode and measuring the current that flows in response to the potential perturbation, which is reflective of the local analyte concentration. Carbon is one of the most abundant elements found on the planet and, from a materials perspective, is unique because of the microstructurally-distinct allotropes it forms. These range from single and polycrystalline diamond, to the stacked sheets of graphite, to the microstructurally-disordered glassy carbon, to nanotubes and fullerenes, and finally to the single sheet graphene. All of these carbon materials are used in electrochemical measurements as well as other technologies, in part, because of some common attributes: high mechanical strength, good thermal conductivity and stability, chemical inertness, high carrier mobility and good electrical conductivity, and rich surface chemistry.

Two forms of carbon that generally perform well in electroanalytical measurements are boron-doped diamond and nitrogen-containing tetrahedral amorphous carbon (t*a*-C:N) thin-film electrodes. I will review some of the basic material and electrochemical properties of these two electrode materials and highlight some examples of how the materials perform for the detection of environmentally-important analytes such as heavy metal ions and estrogenic metabolite. Analysis of the latter compounds was accomplished using FIA-EC and LC-EC.

Dr. Vincent Mortet
Head of MNB Group

RNDr. Petr Šittner, CSc.
Head of Department of Functional Materials

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