GRAPHENE DERIVATIVES TOWARD ADVANCED ELECTROCHEMICAL BIOSENSING

URBANOVÁ Veronika, OTYEPKA Michal, ZBOŘIL Radek

Palacky University in Olomouc, Regional Centre of Advanced Technologies and Materials, Olomouc, Czech Republic, EU

Abstract

Covalent modification of graphene by attachment of suitable heteroatoms represents an attractive way to tailor its physical, chemical and sensing properties. In this context, development of new graphene derivatives for electrochemical sensing might result in fabrication of many new high-performing analytical devices based on different strategies reflecting their particular chemical and/or physical properties. Such biosensors can be afterwards used for detection of specific base sequences, which is important for the rapid diagnosis and treatment of various diseases.

In this work, we present two examples of graphene derivatives: thiofluorographene and low fluorinated graphene. Thiofluorographene, obtained by simple nucleophilic substitution of fluorine atoms in a polar solvent, was used as a low cost biosensor for impedimetric detection of DNA hybridization. Fluorinated graphene prepared in control way by fluorination in F2 stream at defined pressure and temperature was used as platform for electrochemical sensing of different biomolecules, i.e. NADH, ascorbic acid and dopamine.

Keywords: Biosensing, fluorographene, DNA hybridization

Author did not supply full text of the paper.